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MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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MEDICINE AND THE MEDICAL AGE

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ORIGINAL COMMUNICATIONS.

THE MANAGEMENT OF FEVER IN PULMONARY TUBERCULOSIS.

BY H. R. M. LANDIS, M.D.,

Assistant Professor of Medicine in the University of Pennsylvania, Philadelphia.

Fever constitutes one of the most, if not the most, important symptoms of pulmonary tuberculosis. Not only will a study of the temperature chart give a fairly accurate insight as to the type of disease, but in addition attention to the temperature variations is of the utmost importance as a guide to treatment.

The use of the thermometer in doubtful cases has been repeatedly urged as a diagnostic measure. The presence of an afternoon rise in the temperature if only to 99° or 99.1° may be the determining point in a case which has indefinite symptoms and slight or even an absence of physical signs. It seems hardly necessary to call attention to the fact that temperature observations in these cases are of little value if taken in the morning. The afternoon rise almost invariably begins about noon and is apt to be present for some hours. If the temperature is taken at noon, 4 and 8 P.M., it will show some elevation if an active process is present.

Another precaution is necessary. It is not generally recognized that even the minute and half-minute thermometer will often fail to indicate a temperature of 99.1° or 99.2° if left in the mouth for half a minute or a minute. Some years ago I made a series of observations at the Phipps Institute on this point. We found that for slight degrees of fever it was necessary to leave the thermometer in the mouth at least seven to ten minutes, and when this was done the three-minute thermometer was quite as efficent as the others. For temperatures over 100° F., the registration is very rapid. We also noted that the mouth temperature should never be taken within ten minutes of anything hot being taken in the mouth, and at least half an hour should elapse if cold substances have been taken. As to the relative merits of mouth and rectal temperatures we found that the former, under proper precautions, were as reliable as the latter. In addition the taking of rectal temperatures is often inconvenient and many patients object to the method. For practical purposes the oral method is sufficiently reliable and, in my opinion, the preferable one.

It is almost universally accepted the world over that rest during the active period of the disease is imperative, and the one symptom beyond all others that requires rest is fever. Years of experience have shown that it is by rest and rest only that fever is eventually controlled. At one time some of the various coal-tar derivatives were occasionally recommended for the reduction of fever, but entirely aside from their injurious depressing effects, they should never be employed. While it is true that they have a marked influence on the heat center and will temporarily cause a reduction of the temperature, it is only a transient effect. The cause of the fever remains un-

touched, and so long as this cause, namely, the tuberculous process in the lungs, continues active fever is almost certain to occur. There are a few exceptions to this, but in the vast majority of cases the presence of fever is to be looked upon as one of the strongest possible pieces of evidence that the disease is active; just as certainly as smoke is an indication of fire.

Alcohol is another remedy which the older writers recommended as being of service when fever was unduly persistent. I have never seen that it exerted the slightest influence in this regard.

Sponging is a symptomatic remedy that is often serviceable if the temperature is unduly high and persistently so both morning and afternoon. It only gives temporary relief, however, and need not be used in those cases in which the temperature is normal or subnormal in the morning. Although the afternoon temperature often becomes very high, it remains so for but a relatively short time, and it is only exceptionally that measures are necessary to reduce it.

It has been claimed that tuberculin will sometimes dissipate the fever. The majority of those who are favorable to this form of therapy warn against its use in febrile cases.

It has become a more or less fixed procedure among the present-day phthisiotherapeutists to institute the treatment in all cases by a period of absolute rest in bed, and this regardless of the severity of the symptoms and the extent of the pulmonary lesions. Experience has shown that this rule is a safe one. It is only by experience that we come to learn that it is impossible, as the result of a single observation, to foretell the probable outcome in a given case or to form any idea of how long it will be necessary for the patient to continue treatment. In the case of a patient whose symptoms are not severe and the examination of whose lungs shows but slight pulmonary involvement, the temptation is often strong to assure him that two or three months will arrest the process. It is only after having the unfortunate experience of seeing such patients steadily and progressively go from bad to worse that we become wary of being too optimistic. It is much better to withhold one's judgment until the patient has been under observation *at rest* for at least one month. By this time one should be able to form some opinion as to the probable outcome. One of the strongest determining points is the presence or absence of fever. If the patient has no fever or whatever fever may have been present quickly subsides, one is usually justified in assuming that the disease is not very active. On the other hand, if fever is present and shows no inclination to subside when the patient is at rest, an active type of the disease is probably present.

In the event of the patient being febrile, how long is the rest in bed to be continued? Generally speaking, it should be an absolute rule to maintain the rest in bed until the temperature is normal and has remained so for a variable period. The continued rest after the febrile stage is reached will depend largely on the length of time it has taken to get rid of the fever. Thus if the temperature becomes normal in two or three weeks the patient should be continued at rest for a week or ten days longer before allowing him to sit up. On the other hand, if the fever has required three or four months' rest in bed to reduce it, the rest must be continued for a considerably longer time when the afebrile period is reached.

Upon being told that they will have to undergo a period of absolute rest in bed, patients usually want to know how long this will have to be. No time limit should be fixed. If a definite time is stated one is certain to regret it. It not uncommonly happens that a patient will show, in the beginning, a temperature of 102° F. or higher. One usually feels with such a temperature that it will take weeks and perhaps months before it will fall to normal, and yet every now and then such a case will have a normal temperature in two or three weeks.

On the other hand, the initial temperature observations may show a range from

99° to 99.3° F. and give every promise of subsiding quickly. Very often such a temperature curve is persistent and may take weeks and weeks before it becomes normal. Although no fixed rule can be given, the following table, compiled by Burton-Fanning gives some idea of the length of time the various initial temperatures may take to become normal:

Average maximum temperature for first week of treatment.	No. of cases.	Percentage in which temperature became normal.	Average number of weeks required to reduce fever.
Between 99.0° and 99.5° F....	37	87.5	3.6
Between 99.5° and 100.0° F...	18	54.4	5.7
Between 100.0° and 100.5° F..	11	46.6	4.8
Between 100.5° and 101.0° F..	9	34.2	6.5
Between 101.0° and 101.5° F..	6	37.5	17.5

From a study of 716 patients under sanatorium treatment, Burton-Fanning found that 50 per cent lost their fever in an average of one month.

I would, however, again emphasize the fact that entire reliance cannot be placed on the degree of temperature when the patient is first placed under observation. Relatively high temperatures may subside quickly, and those which show but a slight degree of fever may persist for an indefinite period.

Having reached the normal level, what means have we of determining that this is probably permanent? Very often a patient will have had a normal temperature for weeks even after being up and about, although not on graduated exercise. During this period he may have a bilious attack or a mild attack of coryza. Such episodes are usually so trivial that in the normal, healthy individual they produce no elevation of temperature. In the tuberculous individual, however, they may cause a sharp elevation of temperature. If they do it is safe to assume that the tuberculous process is not arrested; it is only quiescent, and the most trivial thing will cause the appearance of fever, although usually transient in character. Under these circumstances one is safe in assuming that the temperature is still unstable, and unless one is cautious a return of the fever may be brought about.

How long should modified rest be continued after the temperature has become normal? If the patient has been very ill and the bed period has been a long one, he should be permitted to sit up for half an hour a day and increase this daily, providing no ill effects are produced. If, however, the infection is a mild one, and the bed period has not been over a month or six weeks, he can usually be allowed to get up and dress and take his cure in a steamer chair. This, of course, entails a certain amount of moving about. After a month of this modified rest, graduated exercise may be started. This is usually in the form of walking. The patient is started with a ten or fifteen minute walk, and this is increased two or three minutes daily up to one, two, or three hours. The increase is allowed to go on provided it does not aggravate the symptoms which are still slightly evident, as, for instance, cough or dyspnea, or there is no elevation of the temperature. If after the exercise, which should be taken in the morning, there is a return of the afternoon fever, no matter how slight, the modified rest must be returned to, and if this fails to restore the temperature to normal, rest in bed must again be resorted to. There is no use temporizing. The longer one defers taking this step the longer it is eventually going to take to reduce the temperature.

Although there is a unanimity of opinion among those of experience in regard to the absolute necessity of rest, especially at the onset, there is a sharp divergence of opinion as to the length of time the rest should be persisted in. There are some who are ultra-conservative and who continue the rest in bed for long periods of time irrespective of whether symptoms continue or not. While I believe that errors are most often made by restricting the rest period, I am equally sure that not a few patients are permanently injured by prolonging the rest period indefinitely. Long after they have become afebrile the rest is persisted in, with the result that the patient becomes unduly heavy and flabby, and more especially becomes

skeptical as to his ability ever to do anything but lie about and avoid even the most trivial exertion. The inevitable sequence is an obstinate neurasthenic state that makes the patient a burden to himself and every one about him. This is not desirable, and it is furthermore questionable whether we accomplish very much by changing one condition into another. Our object, of course, is to first arrest the tuberculous process and, as soon as is compatible with the extent of the pulmonary lesions and the original severity of the symptoms, to restore the individual to something approaching his original condition. This can be done only by feeling our way with exercise, and in my opinion the sooner this is undertaken the better. The longer one has to continue the period of absolute rest the longer it will take to inure the patient to exertion; and an added danger is, of course, the mental effect of being constantly cautioned against exertion. Therefore, between the two extremes of (1) indefinite rest in bed and (2) a foolish disregard of danger-signals, such as fever, increase of cough, loss of weight, etc., there is a middle course. In other words, patients should not be treated routinely but should be considered individually. So long as fever continues, or the weight remains stationary or untoward symptoms unexpectedly develop from time to time, rest must, of course, be continued. But when these evidences disappear, I feel very strongly that the trying out of the patient's resistance should be instituted as early as possible. Providing this is not done rashly and due regard is paid to whether the symptoms are aggravated by the exercise, no great harm will result. The patient should be cautioned that it is entirely a matter of experiment and that no one can foretell, in a given case, as to whether the taking of exercise will prove beneficial or harmful. He can be assured, however, that if he follows instructions and does not exceed the prescribed amount, little or no damage will result.

The question of determining the fitness of a patient for a reasonable amount of exertion has a distinct economic importance. The man or woman financially able to protract the treatment indefinitely can be carried along more gradually than the man whose resources are limited and who in addition has the responsibility of a family to support. Even if the patient is cared for in a free institution the expenses of his family go on, and the sooner he is restored to a wage-earning capacity the better. I do not wish to be understood that such patients should be pushed unnecessarily, but I would again emphasize the fact that it is bad economics as well as being bad for the patient to protract the rest treatment too long.

Another application of rest in the treatment of fever is the use of artificial pneumothorax. This method is simply applying to the diseased lung the surgical principle of putting a diseased tuberculous joint at rest. The compression of the lung by nitrogen gas or sterile air is analogous to the use of a splint. This method, which was heralded a few years ago as a cure-all, has lost some of its popularity as an agent which is generally applicable. It has, however, a very distinct place in the therapy of pulmonary tuberculosis, and one of its fields of usefulness is in the type of case which is obstinately resistant to the ordinary methods of treatment. In such cases, in spite of continued rest in bed and the usual hygienic and dietetic measures, the fever persists, the cough and expectoration continue unabated, the patient fails to gain or often gradually loses weight, and the physical signs are indicative of softening and breaking down of the lung tissue. Collapse of the affected lung, or if both are diseased the worst one, will at times bring about an extraordinary change for the better. During the past six months I have had two excellent examples of this at the White Haven Sanatorium. When first seen one of these patients seemed to offer every prospect of a rapid arrest of the disease; the other one was doubtful. From the onset both did badly. The temperature gradually assumed a higher range in the

afternoon, there was loss in weight, and the cough gradually increased in severity. At the end of three months it became apparent that the ordinary methods offered little or no hope for an improvement. Artificial pneumothorax treatment was, therefore, advised. For four or five weeks each biweekly injection was followed by a temporary increase in the fever. At the end of this time, however, the temperature rapidly fell to normal, and coincidentally with this improvement in all other particulars soon became manifest. One of these patients has gained 22 pounds, is free from fever, and is taking two hours' exercise daily. The other bids fair to do the same thing, although the general improvement, so far, has been less striking.

Under what circumstances can the rest treatment be modified if fever is present. There are two groups of cases to be considered. In the first place there is the chronic case of many years' standing. Usually the lung lesions are more or less extensive and cavity formation is commonly present. If such a case has never undergone treatment the method should be the same as that outlined above for the early case. If, however, the general condition is good and the patient has had one or more experiences with sanatorium treatment, slight elevations of the temperature (99°-99.3°) three or four times a week need not necessarily call for absolute or even modified rest. There are many such individuals, some of whom follow their daily employment, who have little or no trouble. How much latitude we will allow such a patient will depend a good deal on how long the disease has been present; whether the patient has been subjected to sanatorium treatment previously; and, lastly, his method of living. If the history indicates disease of long standing and the patient has learned his limitations, he can be trusted to be up and about and even work, although some slight degree of fever is more or less constantly present.

Finally we have to consider the management of the hopeless advanced case. A marked degree of afternoon fever is almost constantly present in these cases. Inasmuch as the outlook is hopeless we can afford to disregard not only the fever but other symptoms. Our object when this stage is reached is to make the patient as happy and as comfortable as possible. In most instances such patients had best be kept quiet and in bed, not because anything is to be expected in the way of improvement, but solely because they are usually more comfortable and suffer less annoyance from their symptoms. Some of them, however, chafe at the prolonged rest in bed; they insist they feel better when up and dressed, and in some instances claim that a little exercise relieves them. The outlook is almost invariably hopeless if a hectic type of temperature is present, the pulse-rate is 120 or higher, and a third of the body weight has been lost; if in addition one or more serious complications are present, a fatal ending is inevitable. Under these circumstances the patient may be allowed to sit up for a time each day and even get dressed if it makes him better satisfied, and at the same time does not aggravate the symptoms. Very often merely consenting to such an arrangement or one or two trials satisfy them that after all bed is the best place.

A word as to the diet. Fever is to be disregarded in so far as feeding the patient goes. It must be borne in mind that we are dealing with a wasting disease. Next to rest, our chief reliance in arresting the disease is by building the patient up and increasing his resistance. Loss of weight must be checked, and furthermore the loss already incurred must be restored. There is no need of following dietary fads. What is wanted is a liberal supply of wholesome, nourishing food. Three meals a day of an ordinary mixed diet, supplemented, if the loss in weight is marked, by six to eight glasses of milk, will give satisfactory results in the great majority of cases. It is necessary, of course, in some instances to have recourse to special kinds of food if the patient has a capricious appetite and an uncertain digestion.

A STUDY OF BLOOD-PRESSURE CHANGES DURING NITROUS-OXIDE-OXYGEN ANESTHESIA.

BY WARREN B. DAVIS, M.D., PHILADELPHIA;
AND
WILLIAM H. SPENCER, M.D., PHILADELPHIA.

Because of the view still held by some that nitrous-oxide-oxygen anesthesia is always accompanied by a rise in blood-pressure, and is, therefore, contraindicated as an anesthetic in cases having sclerotic arteries and myocardial degeneration, these observations were thought worthy of record. The blood-pressure values were taken by the auscultatory method on the right arms of patients who were in the recumbent position on a flat operating table. The ages of the patients ranged from ten to eighty-three years. The Tycos aneroid apparatus was used, and all of the patients above sixteen years of age had received one-half hour preceding the time of operation one-quarter of a grain of morphine sulphate and one-one-hundred-and-fiftieth of a grain of atropine sulphate. In the majority of the cases the nitrous-oxide-oxygen mixture was given as a preliminary to ether anesthesia, and in these cases the time varied from three to five minutes; a number of observations were made during nitrous-oxide-oxygen anesthesia of a longer duration—forty-five minutes being the longest.

Of the fifty-three cases studied, fifteen per cent showed a rise in blood-pressure of more than 10 mm. of mercury; and in these cases there always occurred rigidity, jactitation, or lividity, usually to a marked degree. As the anesthesia deepened and relaxation occurred, or cyanosis was corrected, the blood-pressure began to fall. The tabulations of the following two cases are representative of these fifteen per cent in which the blood-pressure rose more than 10 mm.:

CASE I.—FEMALE, AGED 33.

Time.	Remarks.	Blood-pressure. Systolic.	Diastolic.	Pulse.
1.08 P.M.		120	78	42
	Gas started.			
1.10 P.M.	Violent struggling.	170	100	70
1.12 P.M.	Rigidity; cyanosis.	170	98	72
1.13 P.M.	Rigidity; cyanosis.	172	100	72
1.14 P.M.	Relaxing.	158	90	68
	Ether started.			
1.16 P.M.	More relaxed.	150	86	64

CASE II.—MALE, AGED 34.

Time.	Remarks.	Blood-pressure. Systolic.	Diastolic.	Pulse.
12.37 P.M.		178	108	70
	Gas started.			
12.38 P.M.	Rigidity; cyanotic.	230	114	116
12.39 P.M.	Rigidity; cyanotic.	210	108	102
12.40 P.M.	Relaxed; pink.	170	104	66

In twenty-five per cent of the cases there was a rise of blood-pressure of 10 mm. or less at some stage of the nitrous-oxide-oxygen anesthesia. An elevation of 10 mm. in systolic pressure was acompanied by either rigidity, lividity, or jactitation to a greater or less extent, and the blood-pressure when these factors were overcome showed a fall below the original reading. This group of cases is typified below:

CASE III.—MALE, AGED 82.

Time.	Remarks.	Blood-pressure. Systolic.	Diastolic.	Pulse.
2.20 P.M.		146	76	70
2.30 P.M.	Gas started.	148	78	70
2.32 P.M.	Color good; relaxed.	150	80	70
2.35 P.M.	Color good; relaxed.	147	75	72
2.40 P.M.	Color good; relaxed.	145	74	71
2.45 P.M.	Color good; relaxed.	144	74	70
2.47 P.M.	Color good; relaxed.	140	72	68

CASE IV.—FEMALE, AGED 44.

Time.	Remarks.	Blood-pressure. Systolic.	Diastolic.	Pulse.
2.45 P.M.	Very nervous.	150	82	68
2.46 P.M.	Gas started.			
2.47 P.M.	Crying; movement.	160	90	70
2.49 P.M.	Relaxed; color good.	140	80	60
2.50 P.M.	Relaxed; color good.	138	82	56

In eight per cent of the cases there occurred no change in the blood-pressure readings, and in all of these cases the anesthesia was quiet and sleep-like and the patient at no time became cyanosed.

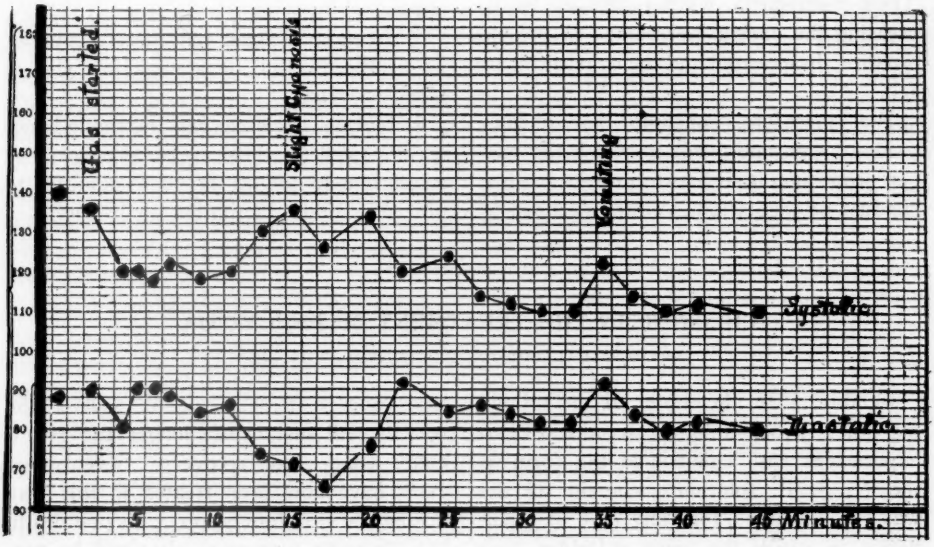
Fifteen per cent showed a continuous fall of blood-pressure of less than 10 mm., and in no case was there marked color change or movement. At the time when the change to the ether cone is made there may occur coughing, holding of the breath, or resistance, due to the irritation of the ether vapor; and in such cases a sharp rise in blood-pressure may occur. The blood-pressure soon falls, however, when the patient becomes relaxed. Tabulation of Case V is an illustration of these points,

for it is seen that during the nitrous-oxide-oxygen period there was a fall in blood-pressure of less than 10 mm., but on changing to the ether cone a sharp rise of blood-pressure occurred, quickly falling when the patient became tranquil:

CASE V.—MALE, AGED 38.

Time.	Remarks.	Blood-pressure. Systolic.	Diastolic.	Pulse.
2.21 P.M.	Gas started.	114	80	34
2.22 P.M.	Color good; relaxed.	112	78	34
2.23 P.M.	Color good; relaxed.	104	68	36
2.24 P.M.	Color good; relaxed. Ether started.	110	78	32
2.25 P.M.	Rigidity; movement; lividity.	150	82	68
2.27 P.M.	Relaxed; color good.	122	82	40
2.28 P.M.	Relaxed; color good.	114	78	36

In the remaining thirty-seven per cent of the cases there was a continued fall of blood-pressure of from 10 to 30 mm. It must be emphasized that in these cases also there was no straining, jactitation, or holding of the breath, and that the patient at no time was livid. The accompanying chart shows graphically a typical case of this series.



Blood-pressure readings during a nitrous-oxide-oxygen anesthesia of forty-five minutes' duration. Female, aged twenty-one years.

COMMENT.

It has been repeatedly observed that anesthesia produced by carbon dioxide, nitrogen, or nitrous oxide without oxygen causes a rise of blood-pressure, and that these gases act in a similar manner—that is, by the shutting off of oxygen.[1]

A survey of our cases shows that in all instances in which there was a marked rise of blood-pressure there occurred rigidity, jactitation, or lividity. These phenomena, the result of oxygen deprivation, or asphyxia, can be easily avoided by increasing the oxygen percentage of the mixture of gases. We have found that rise of blood-pressure rarely occurs if the patient's color is kept free from duskiness.

It was observed that in cases in which there was a rise of blood-pressure the diastolic pressure was relatively less elevated and the pulse-pressure correspondingly increased. This suggests that the blood-pressure rise is more due to an increase in the force of the heart-beat than to vaso-motor stimulation. The tabulations of Cases II and V illustrate this point.

The change to the ether cone may be accompanied by holding of the breath, cyanosis, and movement, due to irritation produced by the ether vapor; a sharp rise of blood-pressure may be here evidenced. This rise in blood-pressure may be seen in the stage of excitement of any straight

[1] Wood-Cerna: THERAPEUTIC GAZETTE, 1890, vol. xiv, p. 509; 1890, vol. xiv, p. 583.

ether anesthesia in which nitrous oxide and oxygen have not been used, and must, therefore, be attributed to the ether and not the nitrous-oxide-oxygen mixture.

It is seen that in sixty per cent of the cases there was either no blood-pressure change, or a fall in blood-pressure of from 2 to 30 mm. In twenty-five per cent there was an elevation of blood-pressure of 2 to 10 mm., which is so slight as to appear negligible. Therefore, eighty-five per cent of the cases of nitrous-oxide-oxygen anesthesia showed either a fall, no change, or so slight a rise in blood-pressure that it can be dismissed from consideration. Fifteen per cent of the cases showed a rise of blood-pressure of from 12 to 50 mm. of mercury, and in these cases there always occurred rigidity, jactitation, and lividity. These phenomena, when controlled by increasing the oxygen percentage in the gas mixture, disappeared and the blood-pressure fell.

We, therefore, conclude that nitrous-oxide-oxygen anesthesia in which the oxygen proportion is such as to prevent lividity, rigidity, or jactitation is either attended by a fall of blood-pressure, no change, or a rise so slight as to be of no consequence.

CONCLUSIONS.

1. In a series of fifty-three cases of nitrous-oxide-oxygen anesthesia, in fifteen per cent there was a rise of blood-pressure of from 10 to 50 mm. of mercury.

2. In twenty-five per cent there was a rise of 10 mm. or less at some time during the anesthesia.

3. Rise in blood-pressure was always accompanied by rigidity, jactitation, or lividity.

4. Eight per cent showed no blood-pressure changes.

5. In fifteen per cent there was a fall of less than 10 mm. of mercury.

6. In thirty-seven per cent there was a continued fall of from 10 to 30 mm. of mercury.

7. In eighty-five per cent there was either no change, a fall, or a negligible rise in blood-pressure.

8. Nitrous-oxide-oxygen anesthesia is not accompanied by a rise in blood-pressure if a sufficient amount of oxygen is admitted to prevent rigidity, jactitation, or lividity.

CHLORINE IN THE TREATMENT OF PNEUMONIA.

BY M. B. HALLDORSON, M.D., WINNIPEG, CANADA.

In May, 1916, the writer of the following lines wrote a short account of his experiences with chlorine in the form of the U. S. P. solution,[1] wherein its use was recommended for "any case of pneumonia in which the urine chlorides have become scanty." Two years' further experience with this remedy (the last year having been almost exclusively devoted to the treatment of lung diseases) has convinced me that waiting for the chlorides to disappear may become a costly error, and that chlorine solution should be used in all cases of pneumonia regardless of type, age of patient, or severity. If the case is mild the patient will get over it quicker and with less danger of setbacks; if severe, the remedy will sustain life longer and give a better chance for recovery. Seventy-two cases have now been treated in this way during the last four years, with one death, but otherwise perfect results; and by perfect results is meant a full and complete recovery regardless of complications.

Four of these patients developed lung abscesses; three have recovered without surgical interference of any kind; one is still under treatment but improving. Two others developed empyema and recovered after rib resection. Another had suppurative peritonitis, and finally recovered after three months of heart-breaking struggle. One had all four lobes involved before crisis came, and another had both lower and the

[1]Chlorine as a Therapeutic Agent. *Journal-Lancet*, Oct. 15, 1916.

right upper involved, and had to be given oxygen for three days before improvement began. He developed an abscess in the left lower lobe, but still was serving in the U. S. Army when last heard from. In none of these cases did the disease leave any permanent after-effects so common in severe cases of pneumonia.

There is no doubt that this number of patients (seventy-two) is altogether too small to form the basis for any hard and fast conclusions as to the value of a remedy. Only a large number of cases extending over several years (for seasons and epidemics differ greatly as to severity) can properly establish this. The mere fact that these patients have lived through the disease has not impressed me nearly so much as the ease and smoothness which has characterized the great majority of these cases, and the promptness with which dangerous symptoms have disappeared when the drug was used only after these symptoms did appear. The case that died had both lower lobes and the left upper involved; still it looked as if he would live through his crisis, but for the fact that he got up and out of bed on the ninth day when the nurse was not watching him and collapsed, and died in three hours from heart failure.

Outside of the ordinary treatment for pneumonia (excepting that calomel must not be made use of for obvious reasons) the following prescription may be given:

℞ Sol. chlori,
Palatol, ää ʒiv.

Sig: ʒss during 3 hours until crisis has passed, when it should be given four times a day, before meals and at bedtime, until health is restored.

At times the amount of chlorine may be decreased toward the last (sol. chlori ʒiij to palatol ʒv). To a child up to four years of age, half to one teaspoonful of the same mixture may be given every three hours; to children four to ten, one and a half to two teaspoonfuls; from ten to sixteen, two teaspoonfuls. Care must be taken that the chlorine solution be properly made. Very few druggists will do this well until they have had some experience with it and have learned the details of making it properly. A simple and easy way to make sixteen ounces of chlorine solution is as follows:

Sod. chlorate, gr. xl;
Ac. hydrochlor., ʒiij;
Aq. destillatæ, ʒxvj.

Place the sodium chlorate in a quart bottle preferably with a glass stopper, add to this the hydrochloric acid, and let stand without heating for a minute or two until the salt is fairly well dissolved; then remove stopper carefully and at arm's length and add about an ounce of water. Now shake vigorously. Keep on alternately adding water and shaking until there are sixteen ounces in the bottle.

If properly made chlorine solution should have a rich olive-green color and strong chlorine odor. Care must be taken that the chemicals combine properly or the solution will contain free hydrochloric acid, giving an unpleasant acid taste to the mixture, which if made right has a pleasant fruity taste and faint chlorine odor. Whenever chlorine solution is used in a mixture it should be put in last, the other ingredients being well shaken up before it is added.

On account of the disagreeable taste and odor of chlorine solution it almost has to be combined with a vehicle of some kind, but because of its extreme activity very few substances will combine with it properly. As a matter of fact the only satisfactory vehicles I have found so far are the lighter extracts of cod-liver oil, especially those made by either Parke, Davis & Co. or Nelson, Baker & Co. The heavier extracts throw down a precipitate when combined with chlorine solution, and so do all other substances I have so far tried. I used the name "Palatol" so that there could be no mistake about what was meant. Formerly I would simply put down extr. ol. morrh., and some druggists instead of using the extract of cod-liver oil would put in the emulsion of cod-liver oil, which with chlorine makes a most horrible mixture, unpalatable and undigestible. For this reason I now write my prescription as above. Nearly every druggist when given this prescription will have to be taught how to put it up, and usually will have to be watched until he has become fairly well accustomed to putting it up. In preparing

chlorine solution either sodium or potassium chlorate may be used, but the sodium salt seems to dissolve better with hydrochloric acid and to make a better solution.

SUMMARY.

1. Chlorine in the form of the U. S. P. solution acts as a true specific in many cases of pneumococcus pneumonia.

2. When pneumonia is due to other germs, such as the influenza bacillus or the streptococcus hæmolyticus, it will probably be found to be less efficacious, but should be given a thorough trial.

3. Every detail in connection with the preparation of chlorine solution given above must be carried out to the letter.

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AN EFFICIENT ANTISEPTIC.

BY DAVID T. HUSTON, M.D.,
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The use of dichloramine-T in dressing wounds has given better results than any germicide so far used. It combines simplicity, cleanliness, and speed in dressing. The solution used is a 5-per-cent dichloramine-T in chlorcosane, except in burns, when a 2-per-cent solution was used.

The instruments required are a pair of dressing forceps, scissors, glass eye-dropper, a long pipette, made to fit a Luer syringe, swab sticks, paraffined mosquito netting, and gauze.

Rubber gloves should be worn and forceps used to handle all dressings.

The edges of the wound and surrounding tissue are first swabbed off with the dichloramine-T solution; the wound itself, if possible, then swabbed with the solution, care being taken to get in all the crevices. This is followed by completely bathing the wound with the solution by dropping from an eye-dropper; or if there be a sinus, by instilling the dichloramine-T with a dropper, or if the sinus be too narrow, by means of a pipette attached to a Luer syringe.

The paraffined gauze is then put directly over the granulating surface, covered with gauze of several thicknesses, and held in place with a bandage or adhesive plaster.

In deep wounds it has been found that the paraffined gauze should be folded so as to make a gutter or wedge, the gauze drainage inlaid in this, and the gauze dressing applied. In every case in which drainage is used paraffined gauze is put directly over the drainage whether it be gauze or rubber tubing. This prevents the drain from adhering to the dressing.

Rubber tissue, at first advocated for drainage, was found to deteriorate when in contact with the dichloramine-T solution, and also to block up the wound, and instead of draining was really plugging. Rubber tubing is advocated only where the quantity of pus is great, and the wound large. In most instances it was found the tube was blocked up, and the pus was escaping around the sides of the tube.

Nearly always gauze, soaked in dichloramine-T solution and loosely packed in the wound, gave the best results. The sprayer originally advocated was found to be of little use, the quantity of solution it sprayed being negative and the time consumed making it more of a hindrance than a help. The solution dropped from a pipette is more efficacious.

Class of Wounds Dressed with Dichloramine-T Solution.—All manner of infected or pus-producing wounds were treated. Furuncles — opened, cleaned thoroughly with the solution, with a swab, a paraffined gauze wedge with a drainage of gauze soaked in dichloramine-chlorcosane—healed completely in from five to seven days.

In one case a furuncle at the elbow was opened and packed as above. The next day the wound looked so clean a stitch was put in and it healed by first intention.

Infected fingers, opened and treated in the

same manner, were completely healed in from seven to ten days. Where the nail was involved it was removed. All infected fingers and hands were put at rest on splints, the splint being placed on the opposite side of the part opened, when possible.

Adenitis, cervical, axillary, and inguinal, opened freely and thoroughly cleaned and packed, healed quickly, the average time being about seven days—some as quickly as four days.

Incised and lacerated wounds, thoroughly cleaned with the solution and stitched, invariably healed by first intention. In fact since using this solution in this class of wounds, particularly around the head and face, it has never been found necessary to remove sutures for suppuration, the wounds invariably healing by first intention.

Granulating Surfaces.—The amount of exudate was less than half the amount one would find in other forms of dressing. The granulations remained healthy, though the process of healing in many cases seemed slower.

Leg Ulcers.—The best that could be said for the solution in these cases was that there was not so much exudate; the ulcers seemed cleaner, but as regards their healing the treatment seemed to be no better than any other form.

Osteomyelitis.—These cases where curettement was done did well, some healing with remarkable rapidity. The wedge dressing seemed to promote the filling in of the wound.

Very badly infected hands seemed to respond remarkably to this form of treatment. The infected area was liberally bathed with the solution, and free drainage secured together with adequate splinting.

Epitheliomas undergoing treatment with radium were dressed by this method. The horrible sloughing, ulcerating surfaces were readily cleaned, the offensive odors negatived, and the patient given much comfort.

Burns.—Burns of all degrees were treated with a 2-per-cent solution; a 5-per-cent solution seemed to cause distress, the patient complaining of much pain.

Burns of the first and second degree healed rapidly, the patients complaining of little or no pain, the discharge in those of the second degree being scanty. The wounds healed quickly and left little or no scars.

In burns of the third degree the granulations seemed to be always healthy, the discharge never was offensive as regards odor, and the patients seemed more comfortable than under any other form of dressing.

The paraffined gauze here was placed directly on the granulating surfaces and then wet with dichloramine-T solution. In removing, the dressing was well soaked with the solution to prevent sticking.

Empyema.—Four cases of empyema were treated, a 5-per-cent solution being instilled directly into the cavity. Three of these had an uneventful and speedy recovery. The fourth, tuberculous in nature, is recovering more slowly, although the amount of discharge at the present time is scanty, and there is evidence to the effect that his wound will heal shortly.

Crushed Toes.—Crushed hands and crushed feet were all treated with dichloramine-T solution, and in all cases the results were good.

In the early use of dichloramine-T chlorcosane, where different solutions, such as benzine, ether, and neutral sodium oleate solution, were used to first clean the skin surrounding the wound, dermatitis resulted in many cases, particularly on legs and arms, where there was bone involvement. It was later found that the skin could be cleaned with the dichloramine-T chlorcosane solution with no bad effects.

In a few cases there seeued to be an idiosyncrasy, one in particular. In other cases the dermatitis was controlled with sodium bicarbonate, given internally. That the sodium bicarbonate really did control this condition was shown by the circumstance that when it was discontinued the dermatitis would promptly begin, and when again started would disappear.

Daily dressings were found all that was necessary, and the soaking of the dressing between times seemed unnecessary.

As many as fifty cases have frequently been dressed in one hour, and in one in-

stance eighty-seven cases were treated, including the dressing of twelve screen cases and three minor operations, such as opening infected fingers or removing toe-nails, all under nitrous oxide, in ninety minutes.

When the variety of dressings is considered this seems a great number.

Individual cases have not been reported. The results were uniformly good; this for many weeks in a large out-patient service. In one case only did the treatment fail, this failure being due to the inability of the patient to tolerate the solution because of a prompt development of dermatitis. This case had three successive periods of treatment with similar results in each.

THE CLINICAL VALUE OF MINIMUM BLOOD-PRESSURE RECORDS.

THORNE, in the *Practitioner* for November, 1918, states that there are two classes and two stages in the full development of arteriosclerosis with hypertension:

1. (*a*) The presclerotic class, in which the heart is still able to cope with the raised blood-pressure and cardiac dilatation has not set in.

(*b*) The presclerotic class, in which the heart has begun to give way under the increased pressure and cardiac dilatation is present.

2. (*a*) The sclerotic class, in which, despite raised blood-pressure and the diseased vessels, the heart has not given way.

(*b*) The sclerotic class, in which the heart has begun to fail and cardiac dilatation is present.

In all the above the objects aimed at in treatment are to give the heart and circulation a comparative rest, to encourage in every way the throwing off of the toxins which cause high tension, and to reduce to a minimum the intake of everything likely to raise the blood-pressure.

In the first stage of Class 1 cure may be obtained by a careful dietary, the administration of suitable drugs, and the general regulation of the habits of life; and in the first stage of Class 2 much good may be done by similar treatment. He does not enter into details of the general treatment, because it has been ably dealt with by several writers upon the subject, notably the late Dr. George Oliver (Studies in Blood Pressure) and Dr. T. Bodley Scott (Modern Medicine and Some Modern Remedies), but he does emphasize the fact that treatment by drugs, dietary, and general rules of life only, does not give satisfactory results in the second stage of either class. When the cardiac muscle is overstretched and the heart dilated, it is almost as unwise to administer drugs which stimulate the heart and do not lower the blood-pressure and undoubtedly depress the cardiac action. It is useless to expect a regulation of diet or a modified rest cure to restore the cardiac tone and cure the dilatation, for they will not do this unaided.

In his experience, the best method of treatment, in both classes and both stages of this disease, is to give a course of "Nauheim" baths in conjunction with general treatment by drugs, dietary, and modified rest. In cases in which cardiac fatigue and dilatation has supervened upon hypertension, either in the presclerotic or the sclerotic stage, this is certainly the only treatment which will give good results of long duration, because it lowers the blood-pressure, slows and strengthens the cardiac action, improves the circulation in all the organs of the body, and thereby facilitates the excretion of the waste products which are the cause of the disease.

Thorne concludes:

1. The importance of taking the minimum blood-pressure in all cases of disease of the heart and circulation is only secondary to that of taking the maximum pressure.

2. When the minimum blood-pressure is not raised above 90 mm. Hg. there is no vessel degeneration, although the maximum reading may be high.

3. There are three chief classes of exceptions to this rule.

4. The full value of blood-pressure records can only be obtained by constant practice and repeated observations.

EDITORIAL.

THE VALUE OF THE WASSERMANN TEST AND ITS BEARING UPON TREATMENT.

The various modifications of the methods by which the Wassermann test is carried out for diagnostic purposes clearly indicate that the test, as it was primarily developed, is not as reliable or as readily applied as is desirable. As with all tests, there is in addition the possibility of grave errors in technique, and all too frequently reports are made concerning the blood and spinal fluid of an individual by laboratory workers who have not sufficient technical skill, through lack of practice, to make it proper to depend solely upon their report. This is a noteworthy fact because so much depends upon it. On the one hand, to tell a man who really has syphilis that the Wassermann test is negative and that this result outweighs the clinical diagnosis when in reality he is syphilitic means that sooner or later he will come to disaster himself and perhaps bring disaster to others. On the other hand, telling a patient that he has acquired this disease, innocently, or otherwise, in the absence of definite clinical symptoms, because a Wassermann report is positive, can bring about almost equally calamitous conditions. It is well known that certain influences change the reliability of the Wassermann test, so far as the patient himself is concerned, in addition to possible errors in technique, as, for example, the ingestion of alcohol.

Because these thoughts have been in our minds for a long time, we read with interest a communication made by Robertson to the *British Medical Journal* as a result of his experience at the London Lock Hospital. He states that he saw a woman with a chancre of seven weeks' duration which represented the typical and obvious appearances of the disease, yet the patient was said not to be syphilitic because the Wassermann test was negative. On another occasion he saw an obvious tertiary lesion in a patient who had been discharged from the hospital some years before as cured because his blood test was negative. In another instance a woman having sought advice was suspected of being syphilitic and a sample of her blood was sent to two different institutions for testing. One of the reports of this blood was negative and the other positive, the latter being correct, for she had syphilis. Blood was again drawn and sent to another laboratory in separate containers, and under two names. Again, the report on one was negative and the other positive, although the tests were made by the same man and on the same day. In still another instance in which a sore was present, no spirochetæ were found and the blood was negative. The patient was treated with mercury, but did not markedly improve for several months, when novarsenobillon 0.6 was given with strikingly beneficial results.

Robertson goes so far as to state that the Wassermann test carried out in the usual way—without an examination of the cerebrospinal fluid—is useless. That, if negative, it gives the patient a false sense of security, and he believes that, if the patient's clinical signs are those of syphilis, treatment must be carried out thoroughly, be the Wassermann test what it may. Finally, he wishes to emphasize the point that one course of salvarsan does not cure. The patient must have more than one course of salvarsan and mercury. Notwithstanding the addition to our method of combating this disease, Robertson also thinks, as has been believed in the past when we had nothing but mercury at hand, that marriage should not take place until at least three symptomless years have elapsed irrespective of the Wassermann test.

In the same issue the *British Medical Journal* in an editorial points out the enthusiasm with which the Wassermann method was received as one which would remove all difficulties in the diagnosis of syphilis, with the result that there has been an exaltation of laboratory diagnosis at the

expense of clinical experience. The *British Medical Journal* expresses the belief that the test is not absolutely specific, often being negative when the clinical diagnosis of syphilis cannot be doubted. The most that it is willing to admit is that it is a valuable aid to the clinician, but a diagnosis based on the evidence of this reaction alone is open to many sources of error.

Readers of the GAZETTE will remember that not long since we quoted a communication by Symmers, Darlington and Bittman, who found at post-mortem evidences of syphilis in only thirty per cent of cases in which the reaction during life had been positive, and contrariwise found from thirty-one to fifty-six per cent which had been given a negative blood report, but which presented at post-mortem examination characteristic signs of the disease. The only fallacy in their observations was that the examination of the internal organs was made by the naked eye and was not confirmed by microscopic study.

Here, again, we have instances which illustrate the point, well recognized by many physicians, namely, that it is, in the vast majority of instances, an error to make a diagnosis or to carry out a treatment based on a diagnosis dependent on only one factor.

GOOD JUDGMENT AS TO BLOOD-PRESSURE.

The instinct of self-preservation on the one hand, and the habit of introspection on the other, lead human beings to be continually more or less anxious in regard to their physical condition. From time to time the advances which are made in medicine are considered by members of the profession and the laity to have arrived at the last word which can be said in regard to a given subject, and as a consequence the results are taken as absolute facts. In reality, they should be regarded with the greatest possible interest, but only as marking another milestone in diagnostic and therapeutic progress.

Any one who chooses to go back over medical literature during the last three or four decades will find that physicians and the laity from time to time have been fairly carried off their feet by new ideas which by virtue of their novelty and apparent reasonableness have been readily accepted. When instruments of precision in the study of the blood first came into vogue it was remarkable how many conditions were said to be dependent upon anemia, and even at the present time anemia is regarded as the cause of symptoms when, in reality, it is, as are all the other symptoms presented by the patient, a result and not a cause. Again, uric acid for years held the front place as a means of explaining certain conditions which were at first puzzling, but which seemed to be quite clear after the uric-acid theory had been promulgated, but now we have learned that uric acid in itself is not harmful, and that it, when in excess, is the result and not the cause of certain conditions of malnutrition or illness.

Another illustration of this tendency to seize upon novel ideas in the hope of obtaining the explanation of illness is found in the all too frequent tendency on the part of some physicians to make a diagnosis of tuberculosis when slight prolongation of expiration and slight impairment of resonance at one apex is taken as a pathognomonic sign of this infection, without remembering that a pneumonia or pleurisy many years before, or a recent attack of influenza, may be the real factor in the case.

Among the more recent of these fads, because they are fads when they are carried too far, is the matter of blood-pressure. In just the same way that a composite photograph of a thousand men might produce a form of nose which would be considered as a normal type, so an estimation of a thousand blood-pressures may be taken as of statistical value in deciding what the pressure of a healthy adult of a given number of years should be. Yet every one recognizes that individuals have very wide variations as to the form of the nose without having an organ which is functionally impaired or in any way incapable of performing its normal duty. The same thing holds true as to

blood-pressure. It may be true that the average normal, in adult life and health, is ninety diastolic and one hundred and thirty systolic, but it is also true that many persons vary considerably from these figures, and yet are in perfect health. Nevertheless they become unduly frightened if they find that their pressure is above or below what may be considered the theoretical normal, and not infrequently get into such a state of mental and nervous irritability that when the blood-pressure is taken it registers ten or fifteen points higher than it usually is in that patient under ordinary circumstances. Furthermore some physicians, and many patients, think that a variation of five or ten points is of the greatest possible importance, when placed upon the scales on the side of evil or on the side of good, when, as a matter of fact, the acuity of the observer of the condition of the patient at the moment that the pressure is taken may be entirely responsible for the varying results obtained at different times.

Because too much attention is paid to blood-pressure many patients are put upon rigid diets which improperly nourish them, and, feeling miserable because of impaired nutrition, they conclude that they are seriously ill.

There can be no doubt that one of the things which we need at the present time is a careful study of blood-pressures, associated with careful estimation of weight and size. A blood-pressure which may be abnormally high for a man weighing one hundred and twenty pounds may be absolutely essential to a man weighing two hundred and twenty pounds, and, on the other hand, a fairly high blood-pressure, which is not distinctly beyond all reasonable bounds, is essential if a powerful man is to successfully take strenuous exercise whether it be along the line of sport or work. As a matter of fact we think it may be fairly stated that the prognosis and therapy of cases of high blood-pressure is to be more governed by careful urinalyses to determine the condition of the kidneys than by any other means. A man who has a blood-pressure thirty or forty points above the statistical normal for his years, and in whom repeated examinations of the kidney function show no renal lesion, may well be put in that class which are considered healthy, and to a certain extent peculiar, because they are higher than the average. On the other hand, if a patient's blood-pressure be twenty-five points above the statistical average and the urine shows some albumin and casts a comparatively moderate pressure has more significance.

Diet in the treatment of blood-pressure is resorted to with too little care in the vast majority of cases. As a matter of fact the rules of diet in such patients can be summed up briefly by the words "moderation in all things," rather than by the words which strike from the patient's list many articles which are highly nutritious and which he needs, not only on a nutritional basis but also because, through years of use, he has gotten his system in such a state that it is dependent upon these food products. We clearly recognize that patients who have taken morphine and alcohol for considerable periods of time have so changed their nutritional processes that they are not only able to oxidize these substances in larger quantities than an ordinary individual, but they may, at times, get distinct benefit from them, and to some extent the same rule holds true in regard to red meats, which the physician is all too prone to strike from the diet list without any good reason except that he is following the fashion which possibly has been started by some prominent member of the profession, who later on has seen the error he has made, but his followers perpetuate his error long after he has recognized his mistake. In other words, most of these patients with high blood-pressure need only to be told to eat sparingly and to use plainly cooked foods and to avoid beverages and condiments which are designed to force a fagged and tired digestive apparatus into dealing with the excessive quantities of food which they may ingest for the purpose of pleasing their gustatory nerves. The old motto "moderation in all things" is to be employed by the patient who has been prone to overeat and

overdrink, and equally by the physician who thinks that because a high blood-pressure is present in a given individual that that individual would be better off if his blood-pressure falls as a result of impaired nutrition, at which time the patient may feel far more ill than he felt when the physician discovered that his blood-pressure was theoretically too high.

Closely associated with this point is the additional one of considering that a patient's pressure is always dangerously high because it shows too high a record at a single examination. This is just as much of an error as to decide that a man's urine is always normal, because a single sample does not reveal a pathological condition. Not infrequently a true record of a patient's average blood-pressure is not obtained until it has been taken so often that the procedure is regarded by the patient as a matter of course, and as a result nervous tension, as a factor in raising blood-pressure, is not met with.

THE BEARING OF MODERN KIDNEY TESTS UPON THERAPY.

Notwithstanding the great amount of work which has been done in the physiological laboratories of the world in investigating the physiology of the kidneys, and notwithstanding the great amount of light which has been thrown upon its functions by these investigations, it is nevertheless true that there are many points about which we are still in ignorance. Many years ago it was thought it had been determined that the Malpighian tufts secreted the watery constituents of the urine, and the uriniferous secreted the solids, but this conception of kidney function is now regarded not only as antiquated, but as incorrect, at least in the sense that it does not fully represent what takes place. Probably no one portion of the kidney is solely concerned in the carrying out of a single function, but different parts vary from time to time in their functional activity.

It is becoming increasingly clear that the duty of the physician when determining the condition of a patient's kidneys must not be limited, at least in many instances, to the mere examination for albumin, sugar, and casts, but he must also study the general functional ability of the kidney and its power to eliminate inorganic and organic substances. It does not necessarily follow, however, that actual disease of certain portions of the kidneys exists when marked variations take place in the eliminating power. Without doubt, changes in the activity of the glands of internal secretion have much to do with the function of the kidneys, and although the liver is not usually regarded as a gland of internal secretion, nevertheless its functional ability greatly influences renal activity.

For many years physicians thought that an estimation of the urea gave some idea of renal efficiency, but it has been recognized for a long time that such estimations are practically useless unless the patient is receiving a definitely limited diet during the time when the tests are being made, and is leading a life in which all the activities of the body may be said to be standardized and kept within certain limited conditions which are practically impossible in the great majority of patients.

Heretofore the tests usually made of the urine have been to show either that the kidneys were healthy or diseased, and when they are found to be diseased, in the sense of chronic disease, we all know that little can be done in the way of cure, and only a moderate degree of assistance can be rendered the patient. Various tests which have been comparatively recently introduced would seem to indicate that by their employment we may recognize threatened renal disease, or at least determine the presence of early changes at a period when something can be done for the patient's relief. In other words, these newer studies promise more from the standpoint of early prophylaxis than from the standpoint of curative therapy.

The first point to be determined in many cases is the ability of the kidney to promptly eliminate water. Normal kidneys should

respond within the first half-hour with a definite increase in flow of the urine of a comparatively low specific gravity which, of course, is synonymous with a lower content of solids. On the other hand, if the patient is deprived of water to a moderate extent, the urine will contain a greater amount of solids and promptly show an increase in specific gravity, and it has been held by some that if the specific gravity does not rise as high as 1.020, or even 1.030 on any diet, this is indicative of kidney impairment, or in other words, an inability to eliminate solids promptly. It is essential, of course, when these tests are performed, that rigid rules governing the ingestion of liquids and solids should be adhered to, so that no marked variation in the intake of these substances will nullify the results.

Again, when a patient is placed upon a known and average amount of sodium chloride for a number of days, and then on a certain day is given from five to ten grammes of this salt, in excess of the average intake, if the kidney is normally competent to eliminate sodium chloride this entire extra amount will be gotten rid of by this means in the next twenty-four hours, whereas if there is distinct retention of salts it will indicate that the kidney's function is abnormal.

Another test, which is of some value, but not so readily carried out, is by the administration of urea. Here, again, the patient having been placed upon a standard diet for a number of days, and the amount of his average urea elimination having been estimated 30 grammes, or about 1 ounce, of urea may be swallowed or, preferably, be injected into a vein. If the kidneys are normal the excess of urea should begin to appear at the end of two or three hours, and it should be completely eliminated in twenty-four hours, but this test is useless unless there is exact control of the albuminous food which is taken, and it is to be remembered that there must be an estimation made of the nitrogenous loss in the stools, since not infrequently the intestines compensate for kidney action.

Within comparatively recent times we have emphasized the importance of an estimation of the non-protein nitrogen of the blood for the purpose of determining renal efficiency. There can be no doubt that where laboratory facilities can be obtained for this purpose this test is of great value in aiding in determining the gravity of the patient's condition provided a standard diet is being followed, and where no standard diet has been demonstrated anything above 30 milligrammes per cent is to be regarded as indicative of serious renal trouble and immediate danger.

Reviewing for a moment what we have already said, it should be pointed out that in most cases of chronic renal disease, there is little delay in the execretion of water, but in acute nephritis the water test has its chief application. On the other hand, in the sclerotic kidney there is a marked diminution in specific gravity, and the use of a diet containing little fluid does not increase the specific gravity as it should do. The phthalein test is an excellent one, but acute congestion of the kidney will often cause a delay which is not indicative of actual disease. In acute nephritis, however, as well as in chronic nephritis, the elimination of phthalein is distinctly impaired.

It goes to show without saying that one test, of any kind, in connection with renal secretion is liable to lead one into great error. Too often a diagnosis is reached on only one analysis.

Finally, it may be asked, what is the bearing of these tests upon treatment? In the first place, where the non-protein nitrogen of the blood is not abnormal and urea when administered is promptly eliminated, there is no necessity for depriving the patient of albuminous food. On the other hand, if there is a tendency to dropsy and the sodium chloride is retained, this is an indication for giving a salt-free diet; not only because the salt is not eliminated, but also because its retention to a large extent causes the dropsy. In many instances the physician arbitrarily cuts down animal foods, or arbitrarily takes salt out of the diet list, when these tests properly applied would reveal that no such punishment of the sick man is necessary.

NITROUS OXIDE AND OXYGEN ANESTHESIA.

In this issue of the THERAPEUTIC GAZETTE we publish an investigation upon the influence of nitrous oxide gas, administered with oxygen, upon blood-pressure. It has been held for many years that nitrous oxide was contraindicated in patients who had arteriosclerosis, or other degenerative changes in the blood-vessels, since it was believed to very sharply increase the blood-pressure and so to put an undue strain upon weakened arteries.

This rise of blood-pressure was also considered disadvantageous in that it increased the labor of the heart.

The paper of Dr. Davis and Dr. Spencer seems to indicate that the administration of oxygen with the gas entirely puts aside this undesirable effect of nitrous oxide; but this paper also emphasizes the fact, which all those who have used nitrous oxide have been particularly careful to insist upon, namely, that to give nitrous oxide gas skilfully requires more training in the technique than is needed for the administration of ether. In other words, a skilful anesthetist using nitrous oxide combined with oxygen gives the patient the safest of all anesthetics, but it is very questionable if this form of anesthesia is to be resorted to with as much confidence as is that induced by ether when these gases are administered by a novice.

THE TREATMENT OF TETANUS.

It is probably the usual custom in all hospitals and dispensaries to treat contaminated wounds, whether they be incised, punctured, or bruised, by a preliminary injection of fifteen hundred units of antitetanic serum. Thereafter the wound is cleansed, and, if the lessons of this war be taken to heart, all devitalized tissue is removed by neat, clean dissection. Closure without drainage is accomplished if this can be done without leaving dead spaces and without exerting devitalizing tension on the surrounding tissues. It is not so generally known as it should be that the protection against tetanus obtained by this injection lasts not more than seven to ten days; that a tetanic infection may persist in a wound for weeks or months, without producing its characteristic toxic symptoms, and that, if such a wound be later subject to surgical intervention without a repeated serum injection, an acutely fatal tetanic intoxication may develop.

The persistence, and, indeed, the virulence of the tetanus bacillus are to an extent dependent upon its association with other microörganisms, and with devitalized tissue in which to grow, preferably that so placed as to favor anaerobic development. Moreover, necrotic muscle seems to afford a particularly favoring pabulum. Vaillard and others have shown that living tetanus spores robbed of their toxins by washing and heating may be injected into animals without causing symptoms of lockjaw. If, however, the seat of injection be devitalized by trauma, injection of pyogenic organisms, or other irritants, the animals experimented on perish with the symptoms of tetanus. Tulloch has demonstrated in the laboratory the well-known clinical facts in relation to gas bacillus infection and tetanus. He showed that one thousand million washed and heated spores in a volume of 1 Cc. could be injected into the gastrocnemius muscle of a guinea-pig without causing tetanus. When this number of spores was injected together with 0.2 cm. of the B. Welchii toxin, the whole having a volume of 1 cm., acute tetanus invariably developed in two or three days. It was further shown that passive immunization with B. Welchii antitoxin prevents the development of tetanus in animals injected with tetanus spores and B. Welchii toxin; thus demonstrating that the B. Welchii antitoxin not only completely neutralizes the toxin of this organism, but gives protection against the development of the tetanus spores in tissue which has been devitalized by the toxins of gas bacillus.

Experiments conducted with washed and heated tetanus spores, plus the toxins of vibrion septique, showed that the latter, though producing a pronounced edema, are

not as stimulating to tetanus development as are toxins of the bacilli Welchii.

Concerning the action of antiseptics upon bacterial toxins, and it is through the action of its toxins upon the central nervous system that tetanus kills, Austin and others have demonstrated that the chlorine group is the only one which can be depended on to break down the toxic protein molecules into other and innocuous forms, though this action is not sufficiently intense to replace the application of general surgical principles in the treatment of infected wounds.

As for the treatment of developing or developed tetanus, the large recent experience seems to have demonstrated that this must be instituted at the earliest moment compatible with an assured diagnosis. In many cases, perhaps in the large majority, there is a general condition of malaise, exaggerated reflexes, or increased pain or discomfort at the site of the wound, symptoms which are not pathognomonic. An early symptom upon which much reliance can be placed is a condition of muscular rigidity near the wound or in the extremity involved.

In regard to treatment of the incipient or developed disease, operative measures, such as excision of the wound or amputation, have not given encouraging results. In a statistical study of more than three hundred and fifty cases, twenty-seven were subjected to operation after the appearance of tetanic symptoms; twenty-two of these died, a mortality of over eighty-one per cent.

The beneficial effect of quiet, sedatives, and abundant nourishment is usually recognized. Neither carbolic acid nor magnesium sulphate have given results which suggest the slightest beneficial effect.

The evidence in favor of tetanus antitoxin is still inconclusive, though there is reason to believe that it has been helpful when given early in large doses, and when its administration is continued till the patient is completely convalescent.

Reference has been made in these pages to the admirable study of Surgeon-General Sir David Bruce, which shows a decrease of mortality from 57.7 to 19 per cent in the last three years, this based on some eight hundred cases observed in home hospitals. In France, where the wounds were of a more serious nature and gravely complicated, the mortality has been reduced from 78 to 67 per cent.

As to the channel of introduction for the antitoxin the inoculation method seems to be the one of choice, the serum preferably being introduced near the wound. Not less than fifty thousand units should be given in the first two days. Thereafter there may be a reduction in dosage, which must be continued daily, or every other day, till all symptoms have disappeared. A statistical study shows that the intravenous and intrathecal administration of the antitoxin has been attended by the heaviest mortality (74.70 per cent); the intramuscular by the lowest (39.5 per cent).

When there is fear of anaphylactic shock, a preliminary injection of two drops of well-diluted antitoxin is followed in five minutes by a dose of 0.5 Cc.; ten minutes later, in the absence of symptoms, by the full dose.

If anaphylactic shock develops, as indicated by pale, wet surface, running pulse, air hunger, and cyanosis, adrenalin highly diluted in saline should be given intravenously.

GAS GANGRENE.

Since gas gangrene is by no means confined to war wounds, but is encountered not infrequently in civil hospitals, the added knowledge which has come from an intensive study of the thousands of cases treated in military hospitals should be acquired and applied by all practitioners of surgery. The anaerobic organisms which cause gas gangrene are made up of two main groups: one, the bacillus Welchii, is essentially a saccharolytic, decomposing carbohydrate with the production of acid, carbonic acid and hydrogen gas; the other, bacillus sporogenes, is a proteolytic, developing from the protein ammonia bodies.

These organisms will not develop unless

implanted on dead tissue; they grow best in muscle, and may become well established if there be an abundance of pabulum within a few hours from their time of introduction. If a large group of muscles be deprived of blood supply, as from the application of a tourniquet to an extremity, the gangrene is massive or segmental. If but a single muscle be devitalized the necrotic process may remain confined to this muscle for many hours.

The gangrenous process is characterized by loss of contractility, dirty-red color, avascularity, and finally shows a black appearance. With the dirty-red stage gas bubbles appear and, if the muscle be superficial, percussion resonance can be demonstrated. From the muscle, through the fascial investment, the gas passes into the areolar tissue and spreads widely, far beyond the seat of actual infection and necrosis; it is injurious only because of the pressure it exerts upon the blood-vessels, this lessening local vital resistance.

The early symptoms are local pain, rise in temperature, pulse hurry, and often vomiting. Locally, if a muscle or group of muscles is attacked, tympany may be the first symptom, followed by swelling, a brownish skin discoloration, crepitation, and the escape of gas bubbles from the wound. The characteristic odor marks the thin black discharge which comes later. The symptoms of the massive type are similar, but more widely spread. The fulminating type is rapidly fatal.

Gas gangrene is favored by the presence of devitalized tissue, tension as from blood-clot, impaired circulation or from tight bandaging, imperfect drainage as from gauze packing. In gangrene affecting a muscle or group of muscles, the treatment indicated is excision of all muscle substance which does not bleed on cutting, does not contract on pinching lightly, or which shows a brick-dust color. In some cases amputation is indicated, this particularly when there is associated bone injury. Mass gangrene calls for amputation through living muscle, short flaps rather than flush removal being indicated.

The use of serum for which laboratory study gave such large promise has not yet proven its large clinical value.

REPORTS ON THERAPEUTIC PROGRESS.

THE CYSTOSCOPE AS AN AID IN THE CARREL-DAKIN TREATMENT OF EMPYEMA.

WILLIS, in the *United States Naval Medical Bulletin* for October, 1918, states that the accurate placing of Carrel tubes, so that every portion and pocket of the wound may be reached, is only second to the thorough opening and removal of all devitalized and necrotic tissue. In the treatment of empyema there is no devitalized and necrotic tissue to deal with, so the problem is one of thoroughly dakinizing the entire cavity accurately so that fresh Dakin's solution may come in contact with the entire infected surface. In the United States Naval Hospital, Newport, R. I., there have come to his attention 36 cases, and several of them still discharged pus after most persistent efforts had been made to clear them up, the Carrel tubes having been pushed into the chest cavities with no definite idea of the extent of the pockets or cavities. It was thought that if the tubes could be accurately placed by sight after careful determination of the extent of the cavity we might more reasonably expect a cure.

Being familiar with the direct vision Braasch cystoscope, Willis could see no reason why this instrument might not be used for the purpose of thoroughly inspecting pleural cavities before placing the tubes, and, further, to aid in accurately placing Carrel tubes in all pockets and over the surface of large cavities. While this is by no means an ideal instrument it is a part of the armamentarium of nearly every hospital. The small speculums of one-half-inch caliber,

electrically lighted, might be more desirable. To facilitate pleuroscopic examination of the chest, at operations, which consist of the usual rib resection at the lowest point of the cavity, he makes the incision a little longer, removes an inch and a half of rib, and stitches the skin margins down to pleura of respective edge. This allows a wider angle of view in the pleural cavity, which is greatly limited if the wound edges are approximated in the usual manner. A sterile cystoscope is introduced through the opening into cavity, thorough inspection of the cavity is made, using air as a medium, and the points for the location of the tubes are selected. A new Carrel tube, stiffened with No. 23 silver wire, is then passed through the cystoscope to the depth desired, and the latter is removed while feeding the tube through the cystoscope, so as not to pull it back out of position. The number of holes to the tube is to be judged by the depth of the cavity to be treated. He has had the apex of a pleural cavity under view repeatedly.

Eight cases have been treated in this manner recently, with very satisfactory improvement in the amount and consistency of the discharge. Owing to the caliber of the cystoscope being so near that of the new Carrel tubing, Willis is considering a new instrument with greater lumen and of a shorter curved beak.

This preliminary report is made in the hope that others will try the method and report their results.

THE ADMINISTRATION OF CONCENTRATED INTRAVENOUS INJECTIONS OF NOVARSENOBENZOL IN THE TREATMENT OF SYPHILIS.

DORE, in the *Practitioner* for October, 1918, once more calls attention to the fact that injections of the "neo" or "nov" arsenobenzol preparations in concentrated solution present many advantages over the method in which a large quantity of solution is injected by gravity, air-pressure, or by the two-way syringe.

These advantages may be stated briefly as follows:

1. Simplicity of apparatus, consisting only of a small syringe and needle, which are portable and easily sterilized.

2. Facility and rapidity of injection, insuring much saving of time in hospital practice and greater convenience in individual cases when the patient is treated at home.

3. Diminished risk of severe reaction, the symptoms of which are generally slight or absent, and especially satisfactory therapeutic results.

The sole disadvantage is the risk of injecting some of the concentrated solution into the cellular tissues, and attention to the following points may enable those who are not experienced in this particular method to avoid the mishap.

The Syringe.—A 10-Cc. syringe is quite large enough; a 20-Cc. syringe is less easy to manipulate, and the shoulder is apt to get in the way and prevent the needle being approximated to the skin at the proper angle. The needles generally supplied with it are also too coarse. Many of the French all-glass syringes hold a little more than 10 Cc., and this is an advantage because there is more room for the drawback of the piston, but the same end is attained by dissolving the drug in 9 Cc. of distilled water in an ordinary Record syringe.

The Needle.—This should be from 1½ to 2 inches long, and not more than 1 mm. gauge, and should fit well over the nozzle of the syringe. It is easier to pierce the vein with a fine than a coarse needle, but it must not be so fine as to prevent the free flow of blood backward into the syringe when the piston is withdrawn. The bevel should be rather short, although this is not of great importance in a fine needle, and the point must always be kept sharp—this may be accomplished by occasionally touching it up with a small slip of carborundum. Needles should not be boiled, but may be kept conveniently in a corked test-tube in methylated spirit to which a few drops of lysol or lysoform may be added.

Preparation of the Patient.—The patient should not take solid food for three or four

hours before the injection, and it is advisable to order an aperient, such as magnesium sulphate, the previous night. He should lie on a high couch in a good light, or the operator may sit so as to be on a convenient level with the patient. The skin is painted once only with tincture of iodine so as not to obscure the vein, and alcohol or ether should not be used. A piece of rubber tubing or a looped bandage, placed above the elbow and drawn sufficiently tight to impede the venous circulation, is held by an assistant or by the patient, who is also given a rolled bandage to grasp in the hand. If the veins do not stand out, flexing and extending the arm or a little massage from the wrist upward, which may be accomplished by the left hand of the operator, will cause them to become prominent. The ampoule containing the drug is opened and the powder completely dissolved, without allowing it to stand too long, in 9 Cc. of cold or tepid, sterile, freshly distilled water in a wide-mouthed bottle or beaker; if desired the distilled water may be kept ready for use in sealed glass ampoules. The solution is then drawn into the syringe, the air expelled in the usual way, and the needle firmly fixed on and dipped into sterilized water to remove the arsenical solution adhering to it.

RODENT ULCER.

BEATTY, in the *Boston Medical and Surgical Journal* of October 24, 1918, states that the following are the methods of treatment which may be adopted in different cases:

(*a*) *Excision.*—As the majority of rodent ulcers are on the face, this plan can be adopted only when the lesion is small, and can be completely removed without a disfiguring cicatrix. Recurrence, even in small tumors, after excision is frequent. He met with a pea-sized rodent ulcer below the mastoid process which was widely excised, and yet it recurred soon after, and was cured lastingly by *x*-rays.

(*b*) *Ionization.*—Ionization by zinc ions is a good treatment, but it is painful, and has to be repeated frequently.

(*c*) *X-rays.*—Sabouraud recommends a full Sabouraud pastille dose every eighteen days for six times. *X*-rays are often successful; even one full pastille dose may be sufficient, but often a much greater number than six may be needed. Graham Little refers to a case eventually cured after 95 applications of the rays. He does not mention, however, what the dose was in each case. Sabouraud's plan is a good one, but if the rodent ulcer is not cured by six applications, according to his method, it will be advisable to space further administrations of the rays over a longer interval—five to six weeks. Some authors recommend one single massive dose of the *x*-rays, viz., three full Sabouraud pastille doses at once. He has had no personal experience with this method.

(*d*) *Carbon Dioxide Snow.*—The treatment by carbon dioxide snow (temperature 79° F. below zero) is often extremely useful. The snow is applied under firm pressure for twenty or thirty seconds. A vesicle or bulla forms in a few hours, and in the course of some days dries into a crust. The crust may remain adherent for a fortnight. One application may cure, but a repetition may be necessary, and is always safe.

He fails to discuss treatment by radium, as he has had no personal knowledge of its value in rodent ulcer.

AMBULATORY TREATMENT OF GASTRIC AND DUODENAL ULCER.

FREEMAN, in the *Virginia Medical Monthly* for October, 1918, well says that in a group of cases like the one under consideration it becomes very necessary to outline a course of treatment which will allow the patients to continue their daily avocation. For pecuniary reasons it is quite impossible for these patients to follow out a systematic rest cure in a hospital, so in the clinic he depends upon the following course of treatment as being one the patient may take at home, and from the results obtained he

feels this treatment is justified. The treatment:

First, *focal infections.* He removes when possible all focal infections, especially those about the teeth and sinuses. He excludes, as far as possible, all conditions within the abdomen which may be associated with, or produce, symptoms similar to ulcer.

Second, *habits.* He stopped the use of alcoholic stimulants, tobacco, tea, and coffee.

Third, *diet.* In his series he gave a mixed diet of carbohydrate, protein, and fats, but he gives the preference to carbohydrate food as carbohydrates leave the stomach more quickly than protein and fats, and by leaving the stomach more quickly make less demand upon the secretory and motor power of the stomach. The opening and closing of the pylorus is controlled by the presence of free acid in the stomach and in the first part of the duodenum. Free acid in the stomach contents coming in contact with the pylorus causes the pylorus to open and the presence of free acid in the first portion of the duodenum causes the pylorus to close, and the pylorus remains closed until the contents of the duodenum are made alkaline; thus, the duodenal control of the pylorus is the stronger of the two. Carbohydrate foods by not combining with the acid in the stomach allow free acid to quickly appear in the stomach contents which, coming in contact with the pylorus, opens the pylorus and permits the food to pass on into the duodenum.

The fact that carbohydrate food leaves the stomach quickly, that it gives the stomach less mechanical work to do, that it makes no demand upon the acid secretions of the stomach, leaves it quite apparent that the diet that makes the smallest demand on the stomach is the one that should give the best results in the treatment of these cases, but in the ambulatory treatment we must always remember that it is always necessary to allow a diet that will retain a sufficient amount of protein and fat to maintain the body in a state of good nutrition, for if nutrition is not maintained the healing of the ulcer will be very much delayed and sometimes be impossible. When possible the following diet was given for the first two weeks:

7 A. M.—6 ounces of milk.
9 A. M.—Egg-albumen.
11 A. M.—Cup of bouillon with one egg.
1 P. M.—Rice cooked in milk.
3 P. M.—Egg-albumen.
5 P. M.—6 ounces of milk.
7 P. M.—Egg-albumen.
9 P. M.—6 ounces of milk.

No food was given from 9 P.M. until 7 A.M.

However, most of his patients were unable to take nourishment every two hours and from the beginning of the treatment were put on soft food three times a day, with a glass of milk or some other liquid food between meals and at bedtime. The following foods were allowed: Well-cooked cereals, especially cream of wheat and oatmeal, mashed potato, baked potato, macaroni prepared without cheese, boiled rice, milk toast, soft-boiled eggs, and stewed fruits. After the patients had been under treatment for two months the light forms of meat, such as chicken, fish, and lamb, were allowed once a day; then the diet was gradually increased until at the end of three months the patients were taking thoroughly cooked vegetables such as spinach, cauliflower, string-beans, etc. This change to liquid and soft diet is so great for this type of patient, who has been accustomed to eating very coarse food rapidly and at irregular hours, that Freeman believes he obtains almost as good results in the ambulatory treatment of these cases as he does with the people in the better walks of life who take the regular rest-cure treatment in a hospital.

Fourth, *hot applications.* Before retiring these patients are all directed to use hot moist applications to the abdomen for forty-five minutes. This adds materially to their comfort by lessening gastrospasm and pain.

Fifth, *medicinal.* His patients were given tincture of belladonna before meals and an alkali after meals. He always began the treatment with three drops of bella-

donna three times a day, and increased one drop per dose per day until the physiological tolerance of the drug was reached, frequently giving as much as 25 drops or more three times a day. It has been his experience that ulcer patients tolerate very large doses of belladonna, and that good results from the use of the drug are not obtained unless it is used in large doses. By beginning with small doses he has avoided the unpleasant toxic symptoms of the drug that occasionally occur. Freeman believes that belladonna indirectly aids materially in the healing of the ulcer by lessening gastric secretion, pylorospasm, or gastrospasm, and by the relief of pain.

These patients were also given moderate doses of 20 to 30 grains of bismuth subcarbonate and calcined magnesia one-half hour after meals. He used magnesia as a rule instead of bicarbonate of soda because it has a laxative effect upon the bowels, has a greater combined power for free acid, and does not produce carbon dioxide in the stomach, which may produce atony.

The author concludes as follows:

1. In a large number of cases of gastric and duodenal ulcer Freeman feels that the ambulatory treatment is justified.

2. That in the dietetic management of these cases the preference should be given to carbohydrate food.

3. Good results are obtained only with those patients who can tolerate belladonna in very large doses.

WHY IODINE?—WHAT IODINE?

STEWART in the *Medical Record* of September 28, 1918, tells us that he has tried many iodine preparations and has at least a half-dozen of them that he finds a use for at times. It will suffice to mention three of them, together with an advantage in the use of each form.

Bottle number one contains alcohol to which crystals of iodine, in excess, have been added. The supernatant liquid when unshaken is the 10-per-cent tincture of iodine that is so often mentioned in the literature of surgery. It is an ideal and powerful counter-irritant, which statement will enable one to determine whether he desires to employ its germicidal power upon a wound or unbroken surface, or whether he does not so desire.

Bottle number two contains iodine hydrate (4 per cent). Its efficiency in arresting pimples, furuncles, and carbuncles is so prompt and good that it reigns almost, if not quite, unrivaled in its capital antagonism to infection with the staphylococcus. As an antiseptic preliminary to puncture of the skin for hypodermic or intravenous medication it has had ample trial and much approval. After application it fades quickly with nothing like the stain or the dermatitis of an ordinary (7-per-cent) tincture. Used in wounds it gives a short and sharp snip that is not comparable with that from the tincture of iodine U. S. P.

The third bottle contains the vinegar of iodotannic acid (acetum acidi iodotannici). Its formula is one ounce of U. S. P. tincture of iodine rubbed up with a drachm of tannic acid and with three additional ounces of dilute acetic acid. Should there be any deficiency the whole mixture is finally made up to four ounces, through the addition of the acid. Within the test tube, in the Petri dish, or upon a slide it may be estimated as about equal to 1:2000 or 1:2500 mercury bichloride in water. But upon a wound or upon an infected area of the living human body under workaday conditions its superiority is so great that a comparison is impossible. For that superiority is apparent from every angle and point of view. As to its effect upon catgut it hardens that and tends to preservation rather than destruction. Whether it will convert a wound from wet to dry in a very short time is largely a matter of complete contact.

Take it all in all, for general office use it is one of the most satisfactory of the preparations of iodine, and lends itself readily to almost every conceivable purpose for which iodine is employed in throat, vagina, or urethra, though it does fall short as a counter-irritant.

THE CONSERVATIVE TREATMENT OF ECLAMPSIA.

McPHERSON, in the *New York State Journal of Medicine* for October, 1918, tells us that it is the purpose of this short paper to describe the results of his method, together with the technique employed, keeping in mind that his article deals with the treatment of cases which were in convulsions when first seen, and that discussion as to etiology and prophylaxis is omitted.

No one is more convinced than he that careful prenatal treatment will eliminate the great majority of these cases, and careful observation of the pregnant woman, with routine blood-pressures, urine examinations, advice as to diet, clothing, and ordinary hygiene, will undoubtedly prevent the occurrence of the greater number of the cases.

There will always remain, however, a certain percentage of physicians who will neglect this prenatal care, either on account of their lack of appreciation of this importance, or on account of the failure of the patients to realize the gravity of the pregnant state, and therefore we shall expect to see a certain amount of this unfortunate complication.

Under such circumstances one cannot simply sit with folded hands and do nothing for the relief of the woman, and yet the mortality statistics of the operative treatment of the convulsive toxemias certainly leave a great deal to be desired.

Quoting from an article read by him before the American Association of Obstetricians and Gynecologists at their annual meeting in Newark in September, 1917, on this same subject, he says:

"A thoughtful survey of the mortality statistics of patients suffering from eclampsia, taken from the reports of numerous writers, both here and abroad, will show that treated by radical methods the maternal mortality approaches an average of from 25 to 30 per cent, and that the fetal mortality averages about 40 per cent, surely a frightful complication, the etiology of which no one knows, and a fact most constantly impressed upon me by reading the numerous dissertations of various authors on their experimental work. A striking contrast to these figures is seen in the report of the last 15,774 cases delivered at Sloane Maternity Hospital, where under reasonable conservative treatment the maternal mortality was reduced to 14.5 per cent, with a corresponding reduction in the still-birth rate. In the previous 2000 deliveries at the same institution, the maternal mortality was 28.3 per cent, with a fetal mortality of 60.15 per cent."

These figures certainly indicate the need of some other method of treatment, and he presents the following alternative in the hope that those who are interested will give it a trial and report their observations.

It is understood that all of the reported cases were pregnant, or recently so; that they all had had one or more convulsions and represented true obstetrical convulsive toxemias.

Immediately on entrance to the hospital the patient's blood-pressure is taken, a catheterized specimen of urine secured, and she is put into an isolation room which is darkened and as much quiet as possible obtained. She is then given, by hypodermic injection, one-half grain morphine sulphate, her stomach is washed out, two ounces of castor oil is poured down the tube at the end of the lavage, and she is given a colonic irrigation of five gallons of 5-per-cent glucose solution.

If the blood-pressure is over 175 systolic, phlebotomy is done, and a sufficient quantity of blood is extracted to bring the pressure down to 150; normal saline is not injected. In his experience it is unwise to bleed the patient if the pressure is lower than 175 systolic, and if, for any reason, a good deal of blood is lost during the delivery the pressure will be reduced so low that the patient may die from shock. The same objection applies to the antepartum administration of large doses of veratrum viride.

The patient is now kept quiet and one-fourth grain morphine administered every hour until the respirations drop to eight per minute. At this time convulsions have usually ceased, the patient will have fallen into labor, and, as has happened in practi-

cally all of his cases, will be delivered normally or by an easy low forceps in a short time. Occasionally, the use of a little ether is necessary to control the convulsions while waiting for the effect of the morphine. The convalescence is treated in the usual manner, as indicated by the symptoms, and has been in his patients significantly uncomplicated.

The series now includes sixty-seven true convulsive toxemias. Of these sixty-seven, seven mothers died, showing a gross maternal mortality of 10.4 per cent. Two of these mothers, however, died before treatment of any sort could be administered—one arriving postpartum at the hospital and dying before anything could be done for her, the other dying of cerebreal embolus while in apparently good condition and after having had but one convulsion. In these two cases no form of treatment whatever would have been successful, so that in a comparative estimate of methods of treatment, such as this paper purports to be, it is fair to exclude these two patients. This, then, leaves a corrected mortality of five mothers out of sixty-seven patients treated in the manner already outlined, or in other words, a mortality of approximately 7.4 per cent. The number of children still-born in the series was 28.5 per cent, which is a considerable reduction over the best figures quoted. Practically all of these were very premature or macerated, and, as in his first report, in no case which was at term and in which a fetal heart was heard on entrance did morphine, although sometimes used in enormous quantities, seem to make any difference in regard to the viability of the child.

After watching with great care the effects of this treatment in the above cases, he feels that it will be a very real contribution to obstetrical progress if, with an open mind, the present radically inclined surgical obstetrician will turn his attention to the more conservative and already well-tested medical method outlined.

He has tried all the other recommended procedures in the past, and can therefore compare the results from his own experience, and according to the present light strongly favors the conservative treatment. Nothing but patient study and experiment will achieve real progress, and he who is not willing to admit the error of a method which shows, through the unfailing accuracy of results, such an alarming mortality will be apt to remain in the background of what we hope and believe will continue to be a well-defined progressive movement toward the saving of life on the lines suggested in this paper, namely, the conservative, as opposed to the radical, treatment of the convulsive toxemias of pregnancy.

A CLINICAL STUDY OF ONE HUNDRED AND FIFTY CASES OF BRONCHIAL ASTHMA.

RACKEMANN, in the *Archives of Internal Medicine* for October, 1918, informs us of the fact, long recognized, that the treatment of bronchial asthma resolves itself into the treatment of the exciting cause if this can be identified. He believes the best results are obtained in the cases of extrinsic asthma, especially in pollen cases. Treatment with an extract of the specific pollen will relieve the hay-fever and the asthma often entirely. Specific treatment of the horse asthma cases is usually only partially successful, although the results obtained justify the effort.

The question of dosage as well as the time interval between doses is, of course, important, but discussion of these factors must be based on a much larger series of cases. The general impression here has been that relatively small doses, only sufficient to cause a noticeable local reaction on the arm persisting for twelve hours, and given not more often than once in five days, have given the best result. The doses have been continued for at least twenty-five days after the asthma has abated.

Throughout his work the dosage has been measured in milligrammes of total nitrogen—not in quantities of solutions.

There has been no experience with specific treatment of other extrinsic causes, but avoidance of the particular protein has usually been possible and satisfactory.

The treatment of intrinsic asthma is far from satisfactory. Local treatment of the nose, throat and teeth has been long considered important. The removal of nasal polypi, the drainage of sinuses, and the extraction of teeth will all relieve the asthma. This relief, however, rarely amounts to a cure, and even if very marked is rarely permanent. The fact that many patients have spontaneous intervals of freedom from asthma which last for months or years makes the results of any treatment difficult of interpretation.

The use of vaccines in the cases presumably due to bronchial infection, whether or not these infections are accompanied by emphysema, and the study of the bacterial flora in the sputum from these cases must be left for some future time.

In following 150 cases, it has been a matter of the greatest interest to discover why periods of improvement have taken place. In most cases no reason for this could be discovered. All of which suggests the marked nervous or autonomic element which doubtless exists. One patient who had been listed under chronic bronchitis and emphysema remained free of asthma, in spite of a continued cough, for eleven months following exactly from the day of performing the various intradermal skin tests on his arm—which tests had been all negative.

Potassium iodide remains, as Lemann (Treatment of Bronchial Asthma, *Am. Jour. Med. Sci.*, 1911, 142, 781) puts it, the sheet-anchor in the treatment of asthma. It is especially effective in cases whose asthma depends on a bronchitic infection.

Calcium salts in the present series have undoubtedly helped some cases.

Adrenalin is a very important drug in the treatment of asthma; a subcutaneous injection of adrenalin chloride solution (Parke, Davis & Co.) will control the attack in almost every case. It, however, has relatively little effect on the general control of the disease. There is much literature on the use of adrenalin in asthma.

Asthma powders of various kinds, most of which contain niter and stramonium leaves, all help the attack, but do not cure. The treatment of associated conditions—constipation, hyperacidity, etc.—is always important, and the writer has seen more than one case very markedly improved on regular doses of a mild alkaline aperient salt.

Frequently unconsidered and apparently unimportant suggestions, such as a temporary change of residence, a slight temporary modification of the diet, ether anesthesia, temporary rest in bed with full diet, correction of faulty attitude, etc., have been of the greatest assistance, and not infrequently have led to a virtual cure. On all these various methods there is rarely any good control, because so many patients have intervals of freedom from attacks, which intervals may last for several years.

NEUROSYPHILIS.

FORDYCE in the *Journal of the American Medical Association* of September 28, 1918, points out that in the past decade much progress has been made in our knowledge of the nature, development, prognosis, and treatment of neurosyphilis. The various types had been correlated with the serology of the blood and spinal fluid and a fairly firm foundation established on which to build in the future. By carefully conserving the data now available, we may be able later to answer some of the questions which so deeply involve the patient's future health and the community's welfare. Some of these questions are the following:

1. Are the present criteria of cure all that are demanded to insure against a relapse of the infection?

2. Assuming that we have a negative blood Wassermann during a year after treatment is discontinued which remains negative after a provocative arsphenamin injection, and that the spinal fluid is not infected, the following questions come up for consideration:

(*a*) Can we assure the patient with certainty against a recurrence? A mathemat-

ical reply cannot be made to these queries, but up to this time we have seen no relapses in patients who have complied with the criteria in question. All the evidence favors the view that a serologic and clinical cure will remain permanent. It is always possible, however, for spirochetes to be hidden away in some of the tissues too few in number to produce the Wassermann reaction, but which may be activated at some future time and produce tissue reactions. This possibility has been observed in syphilis of the eye and in arteritis of undoubted syphilitic origin.

(*b*) Does freedom of the nervous system from infection in the first year with a positive blood Wassermann indicate that such infection cannot occur later from an uncured focus? This question can only be answered when we carefully compare the data obtained from cases of early infection with future observations of such patients. All institutions and physicians should therefore preserve carefully all records, serologic and clinical, and compare them with those obtained in future examinations. Standardized methods of diagnosis and treatment (amount and kind) with results should be adopted and preserved in the form of a medical register like the one used in the medical department of the Army.

THE PREVAILING PANDEMIC OF INFLUENZA.

KEEGAN, in the *Journal of the American Medical Association* of September 28, 1918, gives this summary:

A rapidly spreading pandemic disease was first recognized at the U. S. Naval Hospital, Chelsea, Mass., August 28, 1918, the first patients coming from the receiving ship at Commonwealth Pier, Boston. It had been carried to this port from Europe, both by patients and by carriers. It promises to spread rapidly over the entire country, attacking between 30 and 40 per cent of the population, and running an acute course of from four to six weeks in each community.

This disease is characteristic of the ordinary endemic influenza, but is more severe and much more contagious. It is caused by a specific virulent strain of the influenza bacillus, against which individuals of the younger generation have relatively no immunity.

In from 5 to 10 per cent of the persons afflicted it develops into a massive and very fatal bronchopneumonia. This pneumonia is primarily caused by the influenza bacillus, this microörganism being recovered from 82.6 per cent of the lungs at necropsy, in 31.6 per cent of which it is found in pure culture. The pneumonia is frequently complicated by pneumococcus or streptococcus infection.

The disease is characteristic of a sudden and severe toxemia, the influenza not being in the blood at any stage. It is not due to a filtrable virus. This was determined by introduction of the filtrate of nasal and throat washings from two typical cases into the anterior nares of nine volunteers, with negative results.

"PARESIS—A LOOK-BACK ON RECENT THERAPY."

HALL in the *Virginia Medical Monthly* for September, 1918, points out that certain rather definite dangers present themselves as unpleasant possibilities in the administration of salvarsanized serum and mercury either intravenously or within the spinal cord. Accidental infection can, of course, be avoided, but the substances themselves are highly toxic, and they may cause damage to certain cells of the body as well as to the spirochete. He regards the kidneys and the tissues of the brain as extremely susceptible to the toxic action of these antisyphilitic substances. We must remember, too, that the brain of the paretic has already been rendered less resistant by the inroads of disease, and that slight additional damage may cause its final physiological disintegration. It is not unwise to remember this fact at the time of contemplated impregnation of the cerebrospinal fluid with

a highly toxic and irritating substance. A certain number of paretics are made worse, and their lives are shortened, Hall feels quite certain, by any kind of specific treatment. A probable explanation of this assumption is offered by the theory that the specific substance is sufficient to irritate and to arouse, but not able to kill, the spirochete. It acts, perhaps, not unlike the warm sunshine of spring on the hibernating rattlesnake.

Any kind of treatment of paresis whatsoever is, in his opinion, inadequate and unsatisfactory. Although we now know the specific cause, and understand fairly well the course of the malady, we are unable to produce cures, notwithstanding the fact that we are provided with two or three so-called specifics. What are the causes of these gloomy views of paresis? The disease is, in the first place, the result of long-standing infection of the central nervous system—the most important but the most easily injured portion of the body. Even when the diagnosis of paresis is made early, irreparable damage has already been done. The parasiticides at our disposal are probably not altogether adequate, and they are certainly not harmless. If given in strength sufficient to kill the parasite, they are prone to kill the patient, or to add to the damage already wrought by the disease.

Syphilis will undoubtedly be on the increase in this country after the close of the European war. We will encounter new strains of spirochetes, and the resulting infection may be somewhat different from that with which we are now familiar. What should be our attitude to the paretic and to his family? For his own welfare and the safety of society we should see to it that he is promptly placed under proper restraining influences. His family should then be told that he is in the incipiency of a disease that will almost certainly prove fatal, but that he ought to be treated for the infection. In carrying out this treatment we should be constantly on the alert not to add by injudicious medication to the damage already wrought by the disease.

INTRAVENOUS INJECTIONS OF ARSENIOUS AND MERCURIC IODIDES IN SYPHILIS AND YAWS.

SPITTEL, in the *Practitioner* for October, 1918, tells us that soon after the outbreak of the present war (since October, 1914), when it became evident that supplies of salvarsan would be increasingly difficult to procure, he set about experimenting on syphilis and yaws with various preparations of mercury, iodides, arsenic, and antimony in common use, taking as a working hypothesis dosage to the point of tolerance by the intravenous route. He was soon convinced that the drugs contained in Donovan's solution lent themselves best to this form of treatment.

The injection he advocates, given in the manner suggested here, will be found to produce effects on syphilitic lesions, whatever their stage, little short of those obtained with salvarsan and allied products. He says this after three and a half years' experience, during which time he has given over 5000 of these injections in syphilis and yaws. And judging from the letters of appreciation he has received from workers not only in Ceylon but also in India, China, the Straits, etc., he finds that the results obtained by others confirm his.

The following are the solutions used: In syphilis he gives 60 grains and in yaws 20 grains of mercuric iodide, if the first formula is used; but the later formula, given below, may be used without modification in either disease:

> Mercuric iodide, grains 60 (40 or 20), grm. 3.5 (2.5 or 1.2);
> Arsenious iodide, grains 87½, grm. 5.0;
> Sodium iodide (1-per-cent sol.), minims 35, 2.0 Cc.;
> Distilled water, to ounces 40, 1000.0 Cc.

[This formula is reproduced from the *Practitioner* as printed. The equivalents of apothecaries' and metric system are not all exact.—ED.]

The solution is made up in the following way: It has to be rendered *slightly alkaline*, and this is best done by first adding to it 20 minims (1 Cc.) of a 0.5-per-cent solution of phenolphthalein, and then neutraliz-

ing by carefully adding drops of a 25-per-cent solution of sodium hydrate (about 2 drachms are required). When alkalinity is reached the solution begins to assume a pink color owing to the presence of phenolphthalein, which thus serves both as an index of correct alkalinity and as a coloring agent. Once the neutral point is reached the alkali is cautiously added drop by drop until a distinct pink color is obtained. If thought necessary glazed litmus paper may be used as a control of alkalinity, but phenolphthalein is much the more delicate index. It is important that the solution should be only slightly alkaline; if too alkaline a precipitate results either immediately or after some hours or days, and the efficiency of the solution is impaired. Should the color fade on keeping it means that it has become too acid (due probably to the presence of hydriodic acid); in which case dilute alkali should be added until the original pink color returns. The solution keeps well for several weeks, and if stored in a glass-stoppered bottle under aseptic precautions may be drawn upon for injection without subsequent resterilization.

In an emergency, a very efficient injection may be made out of ordinary Donovan's solution, which is the first solution Spittel used in his earlier experiments. Donovan's solution is diluted with an equal quantity of strained sterile water; it is then rendered slightly alkaline by adding drops of a 15-per-cent solution of sodium hydrate while testing with litmus paper. The dose of this is from 7 to 12 Cc. for intravenous administration. Its disadvantage is that it contains too much mercuric iodide, and is apt to cause much salivation if not cautiously used.

The solution he now uses as a routine is as follows:

Mercuric iodide, grains 50 (grammes 3.24);
Arsenious iodide, grains 40 (grammes 2.59);
Sodium (or potassium) iodide, drachms 8 (Cc. 28.42);
Aqua destillata, ounces 40 (Cc. 1000).

Dosage and Mode of Administration.—Eight to 15 Cc. is the dose for an adult. The dose should be small to begin with and gradually increased according to tolerance. Four to six injections at intervals of four days to a week constitute a course. Several such courses should be given, with intervals of a month or six weeks between them.

The injection is administered with a 20- or 30-Cc. glass syringe, into which the required quantity of solution is drawn; the syringe is then filled to its full capacity with sterile water. This further dilution is necessary to obviate the slight phlebitis that is otherwise apt to ensue, rendering future injections into the same vein somewhat difficult. The solution is introduced into the vein after the usual manner of intravenous injections; should any of it escape into the tissues outside the vein, pain, tenderness, and induration are caused.

The reaction depends on the dosage employed; it is negligible and evanescent if the dose is graded to tolerance. Heart and kidney disease are no contraindication to cautious dosage. One or more of the following symptoms may be produced within a few hours of injection: Chill, fever, malaise, headache, vomiting, pains, and a burning sensation in the body. Later effects are gingivitis and salivation, coryza, lacrimation, diarrhea, and griping.

Results.—There is no lesion of syphilis that is not markedly and rapidly benefited by the injection. One dose is often sufficient to cause the disappearance of recent lesions. The primary sore heals rapidly, leaving little induration behind. The lesions of secondary syphilis quickly disappear, as well as such symptoms as headache, osteocopic pain, etc. Cutaneous syphilides of all kinds, mucous papules, snail-track ulcers, etc., get well after one or two injections. Tertiary lesions such as gummata, ulcers, nodes, etc., improve with remarkable rapidity; so do joint-pains, headaches, bone-pains, and recent eye affections such as iridocyclitis and keratitis. A constant feature of these injections is the inflammatory reaction (Herxheimer) that follows them. Any lesion, whether it be the primary sore,

the cutaneous syphilide, the node, or the inflammation of the eye, becomes more painful and inflamed some hours after the injection before becoming painless and subsiding.

Yaws, too, is greatly benefited by the injection. The moist frambesiform papules of secondary yaws are rendered dry and heal under their scabs, but not quite as quickly as with salvarsan. The pains in the joints and bones quickly disappear. In tertiary yaws recent and painful nodes become painless and quiescent after one or two injections. But nodes that have existed for months, it may be for years, are not reduced with anything like the same rapidity—the same is true of salvarsan; repeated injections eventually cause the disappearance of many of these.

The reduction of mercury dosage in the treatment of yaws is perhaps advantageous, for the drug does not exert the same beneficial influence as in syphilis. Iodine is the drug *par excellence* in yaws.

In judging the response of yaw lesions to treatment, there are certain facts to bear in mind: (1) Many of the ulcerations are secondarily infected with pus organisms which thrive under the surface crusts; (2) the patients are more often than not ill-conditioned and anemic, and in them weak ulcers tend to persist through lack of recuperative power on the part of the tissues. In both these events the results of treatment, whether with arsenious iodide or salvarsan, are apt to appear disappointing at first sight, if in the one case local measures are not at the same time adopted, and in the other drugs, such as cod-liver oil and iron, are not given internally.

Spittel reaches these conclusions:

1. Intravenous injections of arsenious and mercuric iodides constitute the best method of administration of mercury and iodide in syphilis and yaws. As evidence of this we have, besides the beneficial and quick results obtained, the constant appearance of the inflammatory reaction, which may be taken as a measure of spirillicidal efficiency.

2. They have a field of usefulness in all stages of syphilis and yaws, in that, besides their spirillicidal qualities, they are capable of bringing about the absorption of new formations and infiltrations in the primary, secondary, and tertiary stages of both these diseases.

3. Although the claim is not made that these injections should replace salvarsan and its derivatives, but rather reënforce them, still, when the latter are difficult to procure, or cannot be afforded by the patient, the injections here advocated are sufficient of themselves to bring about a cure.

4. Lastly the ease with which these solutions are prepared and administered, and their infinitesimal cost when compared with salvarsan—several hundreds of these injections may be given at the cost of one of salvarsan—place them at a great advantage.

THE MYTH OF ANAPHYLAXIS.

The *Medical Record* of September 28, 1918, comments editorially on this subject as follows:

Authorities continue to insist on the necessity of large doses of serum in the treatment of diphtheria. There should be no hesitation, no scruples, they say, to swerve the practitioner from his duty in this respect. Nor should the patient shrink from his duty in the same dilemma. In this connection the subject of anaphylaxis at once looms up as the chief deterrent in practice. Jousset, in an article which appears in *La Presse Médicale* of August 5, gives his experience and convictions concerning the alleged peril of anaphylactic shock. He has long been accustomed to give large doses of serum in tuberculosis. He has often seen the phenomena of anaphylaxis innocently produced, but never were these serious in character, and he has had opportunities for an unbiased study. To assume that sera are dangerous is to warp the judgment. In his tuberculosis work he has had to employ large doses of

increasing size, yet he knows nothing of that famous bugbear which is the terror of the practitioner. He begins with a dose of 100 to 150 Cc. and often reaches a total dose of a pint, a quart, and even more. Aside from the local reaction, which is more apt to be excessive with the high dose, the percentage of serious accidents is but little larger with the high than with the small and medium dose. Hence anaphylaxis is not to be regarded as a matter of dosage. The eruptions are aggravated by large doses and are, perhaps, threefold more pronounced; but to renounce large doses for this reason would be like failing to give a malarial subject the benefit of quinine because of some collateral action of that drug.

The author continues to berate the phantom of anaphylaxis, "that caput mortuum of serotherapy." No doubt the word covers up much ignorance, and all obscure and mysterious untoward phenomena are laid at its door. Because of "anaphylactophobia," Jousset says, many a life has been lost. He goes so far as to assert that there never has been a well-recorded case of fatal or severe anaphylactic shock due to repeating a serum injection. He asks to be shown that he is mistaken in this claim. He limits the subject to subcutaneous injections, the kind almost always practiced. He has made more than 1500 such injections and has yet to see a case. He admits that after intravenous injections—of salvarsan, for example—and without reference to previous injections, alarming crises have developed; but upon analysis these do not resemble Richet's anaphylaxis. It is evident that anaphylactic shock must be instantaneous, but the severe reactions which follow intravenous injections may appear only after the lapse of hours.

The fact of previous sensibilization, which is the very essence of the anaphylactic phenomenon and which alone makes the phenomenon intelligible, is found on analysis of reported cases to be non-existent in the majority—in other words, the phenomena, whatever else they may be, are not even anaphylactic, but come under the head of serum sickness. What then becomes of anaphylaxis in medical practice? We see here only the simple operation of a toxin—not a general property on the part of the serum but an individual intolerance. The latter is conceivably of the same nature as individual intolerance to foods of a certain type. Let us, therefore, Jousset insists, speak of serum intolerance and not of anaphylaxis. The bugbear of anaphylaxis has to do solely with the repetition of an injection, and if the subject has shown no intolerance to a first injection we need have no fear of repetition. The author's chief dread in serotherapy is of Arthus's reaction—a local phenomenon—and this because of the possible development of a phlegmon. This is positively the only accident the author fears, because it can neither be foreseen nor prevented. But this phenomenon is not due to intolerance of an individual character. It is an artifact, so to speak, and to be charged up largely to defective technique. The size of the dose cuts no figure, but it is a phenomenon of repeated injections, which explains why it is erroneously classed as a local anaphylaxis. With certain precautions it should not be seen oftener than once in fifty subjects.

NITROUS OXIDE IN LABOR.

The *Medical Record* of September 28, 1918, states that COBURN presented a paper upon this subject to the Medical Society of the State of New York. He said that while twilight sleep had had its day, he felt that it had done a great deal of good in waking people up to demand relief for the woman in travail. After drawing the distinction between analgesia and anesthesia, he said that nitrous oxide analgesia should be instituted as soon as the contractions produced a decided pain, which was usually at the end of the first stage; the emphasis, however, should be put on the degree of pain rather than on the stage of labor as a guide for beginning the administration of the nitrous oxide. To administer the nitrous oxide a more or less complicated

apparatus was required, yet it could be administered by a comparatively simple apparatus and a single cylinder. The patient should be instructed how to coöperate. Upon the first indication of the contraction, either announced by the patient or detected by palpating the abdomen, the mask should be quickly applied and the patient should take three deep rapid inhalations of the nitrous oxide. At the end of the third inhalation she should hold her breath as long as possible and "bear down." This usually furnished complete analgesia for a complete contraction. It was quite essential that the patient should hold her breath as long as possible. The bearing down not only augmented the expulsive effort but also increased the rapidity of the absorption of the nitrous oxide. The number of inhalations was important and should be regulated according to the requirements, no more being used than was necessary to produce analgesia. The nitrous oxide was discontinued during the interval between contractions. Two deep inhalations gave quite a profound analgesia with the average patient, and four gave a marked analgesia.

The writer discussed the different types of apparatus that might be used; he also said that different types of inhalers could be employed. He preferred the face inhaler. It was possible after instruction for the patient to administer the nitrous oxide herself, and this was a psychological aid as it directed the patient's mind to extraneous matters. Five to twenty per cent of air or of oxygen might be admitted with the inhalation of nitrous oxide as a routine. The writer discussed the technique by which the amount of oxygen could be regulated. When the nitrous oxide was administered only after the uterus had begun to contract, and then only for a few inhalations, very little if any nitrous oxide reached the fetus, for the contracted muscle prevented it reaching the fetal circulation until the end of the contraction, and by that time most of the nitrous oxide had been eliminated as it left the blood stream about as rapidly as it entered. It was not advisable to allow the patient to become cyanosed. If the patient showed signs of cyanosis more air should be admitted or fewer inhalations should be given. If at first pains were severe but ineffectual and the analgesia did not work well, a good sedative should be administered. When the head was passing over the perineum the analgesia should be continuous and deepened into anesthesia if there was danger of a tear. Nitrous oxide would not prevent the pain of a deep laceration.

The use of chloroform should not follow nitrous oxide analgesia. He was much afraid of this sequence, and reports from a hospital in New York where this sequence had been tried confirmed his fears. If a deeper anesthesia were required ether might be used; it acted about as quickly as chloroform when given after nitrous oxide and was to be preferred as an adjunct to nitrous oxide.

SPANISH INFLUENZA IN THE ARMY.

Mix, in the *New York Medical Journal* of October 26, 1918, states that he finds it convenient, when the patient enters the hospital, to see to it that his gastrointestinal canal is put into a hygienic state and that his nose and throat are properly sprayed. He has done this as a routine in certain wards, and not in others, and has concluded that fewer cases of pneumonia develop in the wards in which the nose and throat are taken care of than in the wards in which no such measures are taken.

In the treatment of pneumonia, the important measure is to keep the patient alive until the crisis is reached, and this can be done, to use a Hibernianism, by keeping his heart beating. The great danger in these cases, as in all cases of pneumonia, is heart failure. The virulence of the toxins is very great, and the hearts early show signs of giving out. Tincture of digitalis ten minims every four hours, or infusion of digitalis two drachms every four hours, or digitalin 1/100 grain hypodermically every four hours as soon as the heart shows the

slightest signs of trouble, is very effective. [This has been our experience.—Ed.] Very many patients show a tendency toward pulmonary edema, which may be thwarted temporarily or permanently by the use of atropine sulphate in a dose of 1/120 grain. For cases showing marked cyanosis aromatic spirits of ammonia, one drop per minute, or twenty minims every twenty minutes in a teaspoonful of water, may tide over a desperate place. Camphorated oil is to be used only in extreme cases. He does not use it interchangeably with digitalis during the whole course of the disease, though some have advocated this procedure. Citrate of caffeine in doses of one to three grains every three or four hours has also proved of value in many instances during emergencies. [Caffeine itself is better.—Ed.]

The cases combined with pneumonia have been helped in some instances by venesection and by the introduction of normal salt solution per rectum. He has not received reports from the laboratory as yet on acetone and diacetic acid in the urine of those most desperately ill, who do not eat at all and who drink but little, who are pouring out alkalies and retaining acids, but he is confident that a great deal of the very intense intoxication is fundamentally an acidosis. Here is a chance for some research work. He is so convinced of this that he is giving some of his patients sodium bicarbonate by rectum and injections of glucose intravenously. He cannot as yet say whether this is a foolish and unnecessary thing to do, but from *a priori* considerations it is a very sensible thing to do. Surely about the third or fourth day of delirium or stupor brings with it a greatly diminished alkalinity of the blood. Experiments with respired air should be made, but at a base hospital with cases running literally into the thousands there is no time for research work. The sick must be cared for.

The cough is a most distressing thing. Codeine is useful, or perhaps it would be better to say is used; yet the cough keeps up until the toxicity so profoundly lessens irritability that the cough ceases spontaneously. During this stage of influenza ammonium chloride is useful, but if pneumonia develops it had far better be omitted. One does not care to try to drown the patient in the secretions of his own lungs, or to tempt the onset of pulmonic edema. Since, however, about 85 in every 150 patients do not have pneumonia, and do have the cough, a good cough mixture of ammonium chloride with codeine and paregoric is very well worth while.

Cases in which pneumonia is going to develop are fairly easily recognized by the temperature, pulse, and respiration charts. If the temperature, pulse and respiration—the TPR—do not fall in three or four days, pneumonia is to be sought for; if the temperature rises after it once falls, pneumonia is to be suspected. All cases in which the temperature is high—103° or more—on the third day are pneumonia suspects, and cardiac stimulation should be started before the pneumonia is demonstrable. All cases in which the temperature remains above 100°, all cases in which the pulse persists above 88, or the respiratory rate above 24, are suspects. Mix found pneumonia clearly demonstrable in a patient with a temperature of 100°, a pulse-rate of 72, and a respiratory rate of 20. This is most unusual, but many similar instances in lesser degrees have multiplied themselves.

Mix cannot refrain, in speaking of the convalescence from influenza, from insisting that patients be kept in bed five days with a normal temperature. He has learned by mistakes. In the haste for men which military officers show he permitted a man to be discharged on the morning of the sixth day of normal temperature; on the evening of the seventh day he sent an ambulance for him and found him desperately ill with pneumonia, from which he subsequently died. He had one fatal case of pneumonia developing in a boy who had three days of normal temperature following influenza. On the evening of the fourth day his temperature was 100.2°, on the morning of the

sixth day it was 106°. He has reached the conclusion that it is wholly unsafe to send out a patient before he has had at least seven days of normal temperature; and thinks as his experience increases he shall arbitrarily raise the date of discharge to ten days of normal temperature.

In treating large numbers of men it is highly important to separate the pneumonia patients from the pure influenza cases. He is fully convinced that this measure is as important as quarantine in measles. This he diligently did by searching out the pneumonias and transferring them. He is not of the opinion that the patients should wear masks; they need to have unhampered respiration. He states that if he had pneumonia and were not delirious he would not consent to wearing a mask. Attendants may wear masks and are asked to do so by government officials, but he would caution all those wearing them to put a new one on every time a patient coughs toward them; for it is easily conceivable that a good dose of influenza bacilli and pneumococci lodging on the masks will, by the industrious breathing of the wearer of the mask, be ultimately drawn into his own system. Better far than masks is resistance to infection built up by plenty of food, enough rest and hours of sleep, and freedom from exposure. In camps, these two considerations, so large and so fundamental, are lost sight of in the minutiæ of formulated schemes of action and conduct.

HOW TO TREAT A COLD SIMPLY AND EFFECTIVELY.

ROBINSON, in the *Medical Record* of September 28, 1918, gives this advice:

As soon as the first premonitory symptoms of a cold manifest themselves, such as sneezing, chilliness, cough, give from 5 to 10 grains of salicylate of ammonium and one-half a grain of caffeine every two hours, for four to six doses, as an adult dose, in capsules or konseals. If it be a child give appropriate dose in solution, with a little syrup of tolu and peppermint water. In many instances the cold will be aborted, or abridged in length and severity. The cold may signify little but passing discomfort, or it may mean the beginning of grippe, bronchitis, or pneumonia. In any event, the salicylate and caffeine are very useful, and sometimes ward off or greatly ameliorate impending trouble.

THE RELATION OF ALCOHOL TO MENTAL STATES.

MAJOR SIR ROBERT ARMSTRONG-JONES in the *American Journal of Insanity* for July, 1918, writes a long article on this topic, in the course of which he uses these words:

"Whilst alcohol may be regarded as a poison—and clearly in this particular what is one man's meat is another man's poison—yet, like many other poisons, it can under certain circumstances be of distinct service to mankind. I may say that I believe the consensus of opinion among medical men in the present day is that in many instances the use of alcohol is to some extent beneficial; but there is a strong section of the thinking public which realizes that alcohol is a lethal weapon which can work the most fell and deadly effects, and that its general use therefore needs the most careful and earnest control.

"We know personally in too many instances brought to our notice that alcohol reduces energy, lowers vigor, diminishes initiative, and paralyzes enterprise, and therefore many persons abstain from it altogether, and they use untiring efforts to prohibit its use by others, and this through the highest motives; but it must not be forgotten that total prohibition breeds vices in regard to drugs, sedatives, and anodynes. At the moment, the public feeling generally is that under the control of the normal reasoning and moral faculties the moderate demands of workingmen and women should be satisfied, *i.e.*, within strict limitations, which is interpreted to apply to its use at meals only, and only by those who find it helpful in their daily work. It is often felt by those who watch events that the logic of

facts has to be carefully weighed against the sentiment of an ideal, and if true progress in regard to temperance is to be encouraged, the watchword must be *festina lente*. However excellent the motives, however firm the zeal and unwavering the devotion, progress cannot be forced, and it cannot be pushed far in advance of public opinion. I know, in regard to the control of the liquor traffic, that both feeling and sentiment have run high and with regrettable consequences.

"It is necessary in regard to this aspect of the question to take cognizance of the state of feeling in all classes of the people, and at the moment there seems to be an irresistible popular feeling against the complete prohibition of alcoholic drink, which that great and useful movement the 'War-time Prohibition,' or the 'Strength of Britain movement,' has already had to experience; nevertheless, it has achieved much useful success in its educational campaign, for it has drawn special attention to a social problem that has been too largely ignored. In discussing this problem, various aspects of the drink question come under review, and the hygienic, medical, sociological and ethical aspects all come up for consideration."

A MORE INTENSIVE FORM OF ARSPHENAMINE THERAPY.

HAZEN in the *American Journal of Syphilis* for October, 1918, states it has been well said that there are now many methods of treating syphilis, but no method. In the past we have been accustomed to give our injections of arsphenamine at intervals that average one week. However, there are a number of reasons why it is desirable to make our treatment more intensive. The drug actually kills the organisms with which it comes in contact, but experimental evidence has shown that a certain amount of immunity may be gained by the treponemata. Also Schamberg says that when given intravenously the drug is almost completely eliminated in three days. The unkilled organisms may have time to reproduce before another injection is given. And lastly, during these strenuous war-times there are certain individuals who simply cannot be kept under observation for a period of two months.

Two years ago a distinguished syphilographer, Pollitzer, advocated giving three full injections in as many days, but to Hazen this method never seemed adapted for general work, inasmuch as it necessitated the best of judgment, much experience, and careful watching of the patient. In addition dangerous reactions may not manifest themselves in time to act as a warning. Several excellent men have followed Pollitzer's work, and repeated it, and have told him of the excellent results that they have obtained in selected cases. The Advisory Council in Venereal Diseases of the Surgeon-General's Office has recommended the use of five-day intervals.

For the past eighteen months to a certain selected number of private patients he has been giving injections at seventy-two-hour intervals. Up to the present time he has given ninety-eight injections to twenty-two different patients, never giving less than three and several times as high as eight doses. There was not a single untoward result; while a number gave the usual reactions of nausea, vomiting, diarrhea, and headache, there were no evidences of any increased intolerance toward the drug. In no instance was albumin demonstrated in the urine, although searched for by the heat and acid method in all cases. None of the cases showed any jaundice and none lost any weight. The preparation employed was an American brand of arsphenamine made by the Dermatological Research Laboratories of Philadelphia. The dose employed was 0.4 gramme per 150 pounds of body weight. For such a dose 70 Cc. of distilled and double-boiled water was used, and the sodium hydroxide solution was pure and fresh. All injections were given in the office and the patients allowed to go home immediately afterward.

The clinical results were very good: every case which presented lesions cleared up very shortly. Nineteen of the patients

showed positive Wassermanns: in one instance a course of three injections failed to change this finding, but in all other instances, bar one, the Wassermann became negative with great promptness; the one case in which there was no subsequent report was lost sight of.

This method has not been employed as a routine, but simply in all classes of cases which would coöperate there was no other method of selection used. Hazen is by no means prepared to say that it is the only method or the ideal method, but only that it is very effective, absolutely safe, time-saving, and that theoretically it should be superior to the long interval method.

MERCURIC CHLORIDE POISONING.

WEISS, in the *Journal of the American Medical Association* of September 28, 1918, states that the treatment which he has proposed consists of an early washing out of the mercury salt from the stomach and intestine and continued introduction of sufficient alkali to overcome the acid intoxication.

The patient should come under observation as early as possible, for he found that when the treatment is delayed for any reason the symptoms produced by the mercury poisoning become more difficult to control. Two patients of his series died, he thinks, because treatment was commenced too late.

He usually washes out the stomach with a mixture of one quart of milk and the whites of three eggs, following this by a saturated solution of sodium bicarbonate until the stomach washings return clear. Finally, before the stomach tube is removed, from 3 to 4 ounces of crystallized magnesium sulphate dissolved in from 6 to 8 ounces of water are allowed to remain in the stomach. A soap-suds enema is then given.

Usually the patient vomits shortly after taking the mercury, thereby aiding in the elimination of the poison.

The next step is to introduce alkali, and we give the alkali by mouth, rectum, and intravenously. As soon as possible after washing the stomach, the patient is given Fischer's solution intravenously. Fischer's solution consists of crystallized sodium carbonate, 10 gm. ($Na_2CO_3.10H_20$) (or 4.2 gm. of the ordinary "dry" salt); sodium chloride, 15 gm.; and distilled water, 1000 Cc.

Depending on the state of the circulatory system, from 1000 to 2000 Cc. of the solution are given intravenously as a first dose. He continues the alkaline medication by giving 8 ounces of "imperial drink" every two hours. This drink consists of: potassium bitartrate (cream of tartar) 4 gm. (1 teaspoonful); sodium citrate 2 gm. (½ teaspoonful); sugar 2 gm. (½ teaspoonful); and water 240 Cc. (8 ounces).

This drink is flavored with lemon or orange juice. The patient is allowed large quantities of it.

There is no restriction in diet at any time during the treatment.

As an indication of the severity of the acid intoxication, and as a guide to the amount of alkali and salt that needs to be given, he uses the analysis of the urine. Except in suppression cases (which were rare in his series) the patient voids large quantities of urine, the amounts depending on the amount of fluid taken. The urine should become alkaline to methyl red (a saturated solution of methyl red in alcohol) and be kept so, for Fischer has demonstrated that if the urine of a nephritic cannot be maintained alkaline to methyl red, the patient continues in a serious state. If the output of urine is not maintained, and if its reaction does not become alkaline to methyl red after the first intravenous injection, a second intravenous injection is given the following day, and general alkali administration by mouth or rectum is continued.

Under this treatment there is usually produced and maintained a free secretion of urine which remains alkaline; and an output of albumin in the urine, which usually develops early, rapidly disappears. Ordinarily, two intravenous injections of the alkali, together with the solution of potas-

sium bitartrate and sodium citrate, which is given at hourly or two-hourly intervals day and night (when the patient is not asleep), has been found sufficient to keep the urine alkaline and to keep the output of urine normal. The blood and casts in the urine are usually quickly dissipated. The patient is kept under observation for about ten days after the urine has become normal, and is then discharged.

Weiss has shown previously that patients treated early show fewer symptoms and make a more rapid recovery than those in whom treatment is delayed.

He has performed phenolsulphonephthalein tests on most of the patients, and it is interesting to note that those who were treated early showed only slight or no diminution in phenolsulphonephthalein output. When the output was diminished, it rapidly rose to normal and continued so. In one patient who developed an anuria for three days, the phenolsulphonephthalein output was practically zero for five days after he commenced to void, and then rapidly rose to 66 per cent at the end of thirty-three days. This patient's urine was normal six months after his recovery from the mercuric chloride poisoning.

A PROPHYLACTIC VACCINE AGAINST THE SO-CALLED SPANISH INFLUENZA.

STONE, in the *Medical Record* of December 7, 1918, states that the primary object in the preparation of this vaccine was, if possible, to protect the nurses of the Ellis Hospital from the complication of bronchopneumonia, which practically is the only cause of death in this disease. Soon after beginning its use, however, its prophylactic power against the influenza itself became so apparent that its employment was extended very generally to the citizens.

As it was believed that a vaccine requiring more than one injection was impracticable for use in an epidemic so overwhelming as was this, it was planned to prepare a vaccine containing all of the organisms found in the sputum of early cases of influenzal bronchopneumonia, test the protective power of one injection, and subsequently make a careful study of the individual organisms, provided the vaccine demonstrated any immunizing power. The vaccine did not contain the Pfeiffer bacillus.

The first recorded case of this malady appeared on the fifteenth day of September, and within a short time enough cases were in the wards of the Ellis Hospital to afford considerable material for study. For many days the sputum in every case complicated with bronchopneumonia was typed, and almost invariably the pneumococcus fell into Type IV. Three of Type III were found in one hundred and twenty-eight specimens, but no Types I or II.

A vaccine was prepared, and, on September 30, twenty-four of the hospital nursing staff were injected. Thirty-two nurses failed to receive the injection.

At the end of two weeks not one of the vaccinated nurses had contracted the disease, although eight of the unvaccinated ones became ill and four developed serious bronchopneumonic complications. The vaccinated nurses cared for the cases complicated with pneumonia, were overworked, and although they wore masks were constantly in an atmosphere of contagion. The nurses who were not injected were not so thoroughly exposed to infection.

As soon as it was learned that a vaccine was in preparation, physicians wished to aid the experiment, and within a few days thirty-five out of seventy-nine had submitted to the injection.

One of the vaccinated doctors developed a very light attack, while eight of the forty-four unvaccinated became ill and three developed bronchopneumonia.

On October 5 the demand for the vaccine became so large that it was made in quantities and supplied to almost every physician in the community. Altogether 12,362 persons were vaccinated: 3300 at a station established at the hospital, and the remainder by physicians at their offices, in the homes of patients, and in the larger manufacturing plants.

The test was rigorous. It started before the epidemic had reached its height and continued until it had completely subsided. Those injected were invariably told of the experimental nature of the procedure; none refused the treatment because of this, and it may be said that the physicians are convinced that the vaccine possesses a distinct protective value. It may also be said that the reputation of the medical men of this community has not suffered because of its use.

Of the 12,362 persons who were vaccinated but 117 developed influenza, and over one-half of these became ill within twenty-four hours after vaccination, demonstrating the fact that injection had been given in the incubation period. Four of these cases were complicated with bronchopneumonia and there was one death.

Many interesting incidents are related by physicians, pointing toward the protective value of the vaccine; many tell of one member of a family refusing the treatment, and later that one was the only member to develop the disease.

One physician was called to a family where five children were ill with bronchopneumonia; a sixth child had escaped infection. The mother stated that this child was at the home of a neighbor when the members of that family were being vaccinated, and he had received the treatment with the rest.

Of course, such occurrences may be termed coincidences, but when seventy physicians tell of them they should be given some weight.

Foremen in the large manufacturing plants have pointed out an interesting phase of the experiment. When the epidemic was at its height, and many of the shops were almost depleted of workmen and those remaining were becoming demoralized, the men were taken in groups to be vaccinated. There was a complete change of morale for the better. The men became cheerful, and many who had remained at home because of fear of contagion were vaccinated and returned to work.

Several letters could be quoted from presidents of companies employing numbers of men. The vaccine had been used in these factories with an influenza incidence of less than one per cent of those vaccinated, while it was from fifteen to twenty per cent among those who objected to the injection.

The vaccine is prepared as follows: Collect six specimens of sputum from cases of influenzal bronchopneumonia, not older than forty-eight hours (the sputum should be as free as possible from contaminating sputum and saliva). Each specimen is washed in several changes of sterile 0.9-per-cent saline, placed in a sterile mortar and ground for five minutes. The culture medium is human blood agar (2 to 10 Cc.), the blood being taken from individuals who had not had influenza nor had been vaccinated. The ground sputum is spread thinly over one or two of the blood-agar petri dishes, with a long, flexible sterile cotton swab, and incubated for a period of twenty-four hours.

Then a few cubic centimeters of sterile saline are poured into one of the dishes and the growth is washed off into the salt solution. As soon as an even suspension is procured, the swab is used to seed from ten to twenty blood-agar plates, and they are incubated for twenty-four hours. The growth is washed from these, saving one or two plates for future seeding purposes.

The suspension is poured into a sterile measuring flask, the washings from twelve plates being usually made up to four hundred cubic centimeters. It is filtered through very thin cotton and five cubic centimeters are placed in a Hopkins tube and given 2800 revolutions per minute for one-half hour. It is standardized at 3 per cent, sterilized at 56° C. for seventy-five minutes, and 1½ per cent of phenol is added. Before using, tests for sterility are made. The dose is 25/100 Cc., which is given subcutaneously, preferably with a tuberculin syringe.

The reaction is usually very slight, and it is believed that the immunity established

lasts for a period longer than four weeks. In order to keep up the virulence of the organisms and to ward against overgrowths and contaminations, fresh cultures from the sputum were made every three or four days.

POINTS ON GENERAL ANESTHESIA.

JOHNSTON, in the *Canadian Practitioner and Review* for November, 1918, states that some surgeons prefer chloroform exclusively in brain surgery, for the reason that the blood-pressure is lowered by it, and consequently they think less hemorrhage is produced. This contention appears to him a fallacy, as the action of chloroform produces such profound depression on the circulatory system, and affects the unstriated muscle in the walls of the vessels, so that there is not the same recoil, when a vessel is cut, and hence hemorrhage is more profuse. His opinion, gained from personal experience, is that it is not so much the drug that is used that increases the amount of hemorrhage as it is the manner in which the drug is administered.

A striking example of the difference in the effects of the two drugs, ether and chloroform, is to be found in the practice of obstetrics. A patient is much less prone to postpartum hemorrhage when ether is given than when chloroform is administered.

The surgeon should be able to recognize signs of danger that may be developing, and be able to direct what should be done to obviate disaster.

For instance, with regard to breathing, if the respiration becomes faster and more shallow, or faster and deeper, under anesthesia, there is some reason for this, and the anesthetic should be discontinued, until it has been ascertained whether this is due to too deep or to too light anesthesia. If respiration is stertorous, it is an indication that the patient is not getting sufficient air. If inspiration becomes short and expiration prolonged, it is a very grave sign, as the patient is either too deeply under or is suffering from shock due to the operation, or both.

If the breathing becomes very quiet and shallow, although it may be regular, the patient is either too deeply or too lightly under. The anesthetic must be discontinued until the two stages are differentiated.

Sometimes the respiration will resemble Cheyne-Stokes. This is always serious.

Noisy breathing, associated with cyanosis, shows that there is some obstruction of the air-way.

Laryngeal spasm may be caused by obstruction of some kind, or an irritable throat, or it may be due to too rapid administration of the drug, or it may be some impurity in the drug.

As to circulation, if the color changes from normal to purple, and from that to pallor, the pulse will soon change for the worse. If pallor alone is present, the circulation has become depressed, either from too much of the anesthetic or from shock of the operation, or both. Pallor sometimes will occur when a patient is too lightly under, owing to the vomiting reflex beginning to manifest itself.

If the ears or the lips become pale, it is always a sign that circulation is failing. With these changes in color there is always a corresponding change in the pulse.

If the pulse becomes quick and small, or irregular, this indicates that circulation is being seriously affected. One cannot dissociate the color and the pulse. The former is the indicator of the latter.

With these changes in respiration and circulation, the pupil will also vary. Oftentimes the first indication that anything is wrong will be shown in the pupilary reflex. If the pupil dilates widely, and the color becomes pale or livid, and the pulse changes for the worse, the patient is in a serious condition.

Sometimes the pupil will dilate widely, although the color and the pulse may be good. This may be due to a reflex from the manipulations of the surgeon, the patient being too lightly anesthetized.

In closing, he states that some surgeons

appreciate more than others the importance of the bad effect produced on the patient by trauma. A patient may be more profoundly shocked, and have a much more trying convalescence, from an operation lasting only half an hour, where the intestines or other organs of the body have been roughly handled, than the same patient would have should the operation last an hour or more, and the surgeon exercise gentleness throughout.

OPEN PNEUMOTHORAX: ITS RELATION TO THE TREATMENT OF EMPYEMA.

GRAHAM and BELL, in the *American Journal of the Medical Sciences* for December, 1918, state that in the preliminary report of the Empyema Commission the opinion was given that in the type of cases of empyema which accompanied the prevailing streptococcus pneumonia, operation should not be undertaken early but should be deferred, in order to allow time for the pneumonia to subside and for the empyema to become more localized by the formation of adhesions.

One of the principal considerations which led to this opinion was the question of the possible harm to the patient caused by the creation surgically of an open pneumothorax in the presence of an already existing state of severe asphyxia. Notwithstanding the apparently striking clinical confirmation of the soundness of this point of view, as shown by our remarkable reduction in the mortality of 4.3 per cent as compared with the average mortality of 30.2 per cent noted in the replies of the various camps to the Surgeon-General's questionnaire of February 21, 1918, it seemed desirable to submit to experimental test some of the considerations which theoretically had led the Commission to the adoption of deferred operation. This seemed especially desirable, since there was a possibility that our low mortality might have been due in some measure to a decrease in virulence of the organism.

Accordingly, work has been carried out along the following lines: (1) a study of the effects of open pneumothorax in normal and diseased chests; (2) the experimental production of a streptococcus pneumonia and empyema in dogs comparable with that in the human; (3) a study of the effect of early operation in dogs with experimentally produced streptococcus empyema. The limited amount of time available for these investigations prevented as complete a study of the problems as seemed desirable, but nevertheless certain facts have been established which seem to have an important bearing on the method of treating the condition.

From the standpoint of pressure relationships the normal thorax may be regarded as one cavity instead of two. Any change of pressure in one pleural cavity is accompanied by practically an equal change in the other, so that an equilibrium of pressure exists at all times throughout the whole thorax. In their experiments the changes of intrapleural pressure have been accomplished only with air, but probably the same conclusions would hold for those effected by fluid.

The prevalent conceptions of pneumothorax are erroneous in that they are based on the assumption that when an opening is made into the chest one lung is collapsed and the other maintains respiration. This assumption implies that the mediastinum constitutes a rigid partition between the two pleural cavities. On the contrary the mediastinum is so mobile that any increase of pressure in one pleural cavity pushes it over into the opposite one so that both lungs are compressed practically equally. No such condition is possible, therefore, of collapse of one lung and maintenance of respiration with the other in a chest with a normal mediastinum.

If, on the other hand, the mediastinum has been made rigid by induration as a result of long-standing inflammation, or if it has become fixed by adhesions, then a pleural opening on one side will not produce the same pressure changes in both pleural cavities.

The maximum opening into a pleural cavity compatible with life depends upon a definite relationship which exists between the amount of air entering the lungs and the amount which enters the pleural opening. The maximum opening compatible with life may be approximately determined for the normal chest by the mathematical expression given in the text. By this mathematical expression it is found that a normal human adult should be capable of withstanding for a short time an opening of about 51.5 sq. cm. (5 x 10 cm., or 2 x 4.1 inches). There is no discrepancy, therefore, between our experimental results and the finding at the front that men are capable of maintaining respiration with gaping thoracic wounds, which seem surprisingly large.

A double open pneumothorax in a normal chest is more dangerous to life than a unilateral open pneumothorax merely because usually the combined areas of the two openings (and therefore the amount of air admitted into the pleural cavities) is greater than a single opening on one side is likely to be. Theoretically and experimentally effects of practically the same severity result in the case of one or more openings into one pleural cavity as follows the creation of a double pneumothorax, provided that in each case the combined areas of the various openings are equal.

The bearing of these results and deductions upon both the treatment of acute empyema and upon thoracic surgery in general is obvious. Whenever the amount of air taken into the lungs is limited by the presence of an active pneumonia, with plugging of both air channels and alveoli, whenever there is an excessive demand for air, or whenever there is sufficient weakening of the respiratory muscles to impair compensation, the size of a pleural opening compatible with life becomes smaller; and if any or all of the above factors are present in sufficient intensity, even a very small opening into the pleural cavity will produce death from asphyxia. Since all of these factors are likely to be present to a high degree during the early stage of an empyema of the streptococcus type, early operation with the establishment of an open pneumothorax carries with it an unwarrantable danger. Aspiration is indicated instead until after the above dangerous factors have disappeared.

Special emphasis has been placed in this article on the changes of intrathoracic pressure induced by an open pneumothorax, but other results such as heat loss, danger of infection, and disturbance of the systemic circulation are of great importance.

THE THERAPEUTICS OF OXYGEN GAS.

The report of the Chemical Warfare Medical Committee (*British Medical Journal*, Nov. 9, 1918) on the administration of oxygen in irritant gas poisoning is of importance as a contribution to a knowledge of the nature and treatment of conditions due to interference with the oxygen supply to the tissues from whatever cause. When inhaled in sufficient amount the ordinary types of lung-irritant gas produce, usually after an interval of several hours, a condition of pulmonary edema; the alveolar tissues become swollen and liquid exudes into the alveoli. The absorption of oxygen is interfered with, owing, apparently, to the greater distance which separates the air in the alveoli from the blood. The hemoglobin in the capillaries is less completely saturated with oxygen than usual, and there is an alteration in the color of the lips and face. If the capillaries are distended with blood the color is a full blue, or plum color, and no one hesitates to describe the condition as cyanosis. If the capillaries are not distended the color is leaden or gray, and the expression "cyanosis" may then not be used, yet the degree of anoxemia—that is to say, of defective oxygenation of the blood—is more extreme in the gray cases than in the blue.

The condition is very formidable if it continues, either in gas poisoning or in an acute illness such as bronchopneumonia. When the anoxemia is serious and contin-

ued the heart and central nervous system begin to fail, the latter in particular becoming seriously injured, and other organs, such as the heart and kidneys, may also be damaged. The anoxemia ordinarily seen in gas cases is caused mainly by imperfect oxygenation in the lungs, but in certain others it may be due primarily to a slowing of the pulmonary circulation by partial capillary thrombosis in the lungs, with consequent slowing of the general circulation, so that the blood passes more slowly through the systemic capillaries, and consequently loses more oxygen.

Recent investigations at the Canadian General Hospital at Taplow have shown that imperfect oxygenation of the blood in the lungs may be brought about in another way. The degree of activity of the respiratory center is regulated by the amount of carbon dioxide in the mixed arterial blood, and this depends on the average ventilation of the whole lungs, for the amount of carbon dioxide removed from the blood in any part of the lung depends on the degree of ventilation of that part of the lung; with greater ventilation more carbon dioxide is eliminated. But the conditions affecting the absorption of oxygen in the lungs are different. With ordinary ventilation of any portion of the lung, the hemoglobin in the pulmonary capillaries is practically saturated with oxygen.

Abnormal increase of ventilation, therefore, is not attended by the taking up of any more oxygen, so that if one part of the lung is insufficiently ventilated there must be a deficit of oxygen in the mixed arterial blood, since overventilation of one part of the lung cannot in this respect replace under-ventilation of another. Thus, though with some parts of the lungs under-ventilated the elimination of carbon dioxide may continue at the normal rate, the rate of absorption of oxygen is subnormal, and the condition of anoxemia is produced.

There is experimental reason for saying that even during perfectly normal quiet breathing the ventilation of different parts of the lung is not evenly adjusted to the blood flow, but so long as there is, on the whole, sufficient oxygen to saturate the hemoglobin to about the normal extent the uneven distribution is of no consequence. When, in a perfectly healthy person, the depth of breathing is artificially restricted, its frequency increases to a corresponding extent; and though the amount of air breathed is also distinctly increased, symptoms of anoxemia soon show themselves. This is explained by the fact that with shallow breathing only the parts of the lungs which expand readily are ventilated, so that the shallower the breathing, however rapid it may be, the greater the tendency to anoxemia. If, as happens in irritant gas poisoning, different parts of the lungs are unevenly obstructed by swelling or liquid, uneven distribution of air will be much increased, particularly if the breathing be shallow.

The investigations at Taplow show further that the tendency to uneven distribution of air and consequent anoxemia is greatly increased in the recumbent position —a fact which explains the orthopnea accompanying respiratory distress in various diseases. The defence of the body against imperfect oxygenation is in the respiratory center, which, when it receives such blood, becomes at once more sensitive to carbon dioxide, with the consequence that the breathing is increased. But the point at which this increase takes place varies, so that the respiratory center cannot be trusted completely to protect the body from the effects of anoxemia, even when the lungs and heart are normal. Further, the nervous regulation may itself be put out of order, owing to local or general shock, and then anoxemia may be produced in the absence of any organic injury to the lungs. Experiment and clinical experience show that the anoxemia of shallow breathing is easily prevented by the addition of quite a small amount of oxygen to the inspired air, and clinical evidence points in the same direction as regards anoxemia produced in conditions of bronchitis, pneumonia, or asthma. The addition of about two liters

of oxygen a minute to the inspired air will about treble the driving pressure of oxygen with normal breathing.

The apparatus used for administering oxygen should make it possible to regulate the flow. The amount given should be determined by the condition of the patient and the improvement in color produced, and no more should be given than is sufficient to keep the color normal. Experience shows that as a rule two or three liters a minute are required in gas cases during the acute stage, after which the quantity may be reduced, but as much as five liters may be necessary for a time. For patients who are simply suffering from shallow breathing one liter, or even half that quantity, may be sufficient, as the deeper breathing caused by a face-piece or mask greatly helps the action of the oxygen. With a mask the patient reinhales part of his own expired air, and the carbon dioxide in it, other things being equal, increases his breathing in proportion to the amount reinhaled. By the simultaneous use of oxygen the distress, in so far as it is due to the want of oxygen, is relieved. Then the rebreathed CO_2 simply makes the breathing deeper, and this in itself is usually an advantage.

The present position of the subject may be summed up by stating that there are three causes of anoxemia: (1) Inflammatory changes in the lungs hindering absorption of oxygen; (2) vascular obstruction in the lungs; (3) irregular distribution of air in the lungs, owing to shallow breathing or partial obstruction of individual bronchi. It is in cases attended by vascular obstruction in the lungs that bleeding may be combined with oxygen administration, and when a case does not respond well to oxygen the probability of obstruction of the pulmonary circulation may be considered. Bleeding, by diluting the blood if it has become concentrated in consequence of loss of plasma, as occurs in acute gas cases, diminishes its viscosity. The increased rate of flow through the lungs will probably far more than compensate for the diminished oxygen-carrying capacity of the blood, which diminishes much less rapidly than the viscosity. When oxygen is not available, bleeding alone will at least relieve the unduly high venous pressure which seems to be always caused by an asphyxial condition of the blood. It may, however, be dangerous in a gray case, as the arterial blood-pressure is probably already low. In such cases it may be advisable to give a saline infusion before bleeding.

REACTIONS DUE TO THE INTRAVENOUS INJECTION OF SALVARSAN AND NEOSALVARSAN, THEIR SYMPTOMS AND TREATMENT.

BEESON, in the *Charlotte Medical Journal* for November, 1918, makes the following suggestions in helping to prevent untoward symptoms after an injection: (1) The use of plain, freshly distilled water as the vehicle. It should be prepared the same day it is to be used. (2) Employ a distillation apparatus which is entirely glass. (3) The solution of salvarsan should be rendered alkaline and then a slight excess, one or two drops, of 15-per-cent sodium hydroxide added. (4) The initial dose of salvarsan should not exceed 0.20 gramme, of neosalvarsan 0.35 gramme. As a rule one should not exceed 0.6 gramme of "606," or 0.9 when giving neosalvarsan. (5) Seven to ten days should constitute the usual interval between doses. In exceptional cases they can be given four to five days apart. (6) The urine should be examined in all cases previous to the injection. (7) Be cautious in giving these drugs to alcoholics and nephritics, also to those who have cardiac lesions, or acute inflammation of the upper air-passages. (8) Always give the injection on an empty stomach. Don't allow any solid food until the next day. (9) Have your patient go home at once after the injection and remain quiet for the rest of the day.

Since the most important symptoms of intolerance, the "nitroid crisis," headache, and diarrhea in certain cases as well as

"serous apoplexy," seem due to a marked vascular dilatation we should think of a vasoconstrictor in the treatment of such cases. The best one for this purpose is adrenalin chloride in 1:1000 solution. Its effect is very satisfactory, at times even brilliant. A fair dose would be one cubic centimeter. As much as four doses has been given in divided doses. He believes that one-half or even one-fourth of this amount will suffice in most instances. In cases of coma give two to four doses within one to two hours.

Adrenalin is best injected deeply into the muscles of the gluteal region. When given subcutaneously its effect is more transitory. The intravenous route should be reserved for urgent cases as in "serous apoplexy." He has found adrenalin especially efficacious against the "nitroid crisis," and also serous diarrhea. No opportunity has been afforded him to personally test its action in "serous apoplexy," but such cases are said to have been cured by it.

Adrenalin should be given ten minutes previous to the intravenous injection. Very soon the patient will become quite pale if the drug is exerting its effect. The "leuco-reaction," as it has been termed, should always be looked for as an index to the efficiency of adrenalin in the case under treatment. Other vasoconstrictors such as ergotin have been used in a similar way, but they have not given equally good results. Hence it is evident that a purely constrictive action is not all that is required. Perhaps as some have suggested a cardiotonic action comes into play.

The pallor following adrenalin having been mentioned, he calls attention to other symptoms which may follow its injection. Acceleration of the pulse-rate even up to 100-200 beats per minute, a more or less generalized trembling, and marked pain at the site of injection, are most common. These after-effects are of brief duration save the localized pain, which may remain for two or three days.

Flushing of the face during an injection of salvarsan or neosalvarsan should be an indication for stopping the procedure at once, and giving one milligramme of adrenalin. A "nitroid crisis" would be treated in the same manner. If no improvement is seen within an hour, repeat the dose. When next your "nitroid" patient comes for an injection give him one or two doses of adrenalin beforehand, and in the majority of cases he will have no reaction or a very mild one. This may be evidenced by a slight flushing of the face, which is really an aborted "nitroid crisis."

In concluding he heartily recommends adrenalin in all these cases. In his experience it has been of real value. The untoward effects following its use are almost *nil,* and the benefits derived are often great.

VENEREAL WARTS DUE TO GONORRHEA IN WOMEN.

JEAGER, in the *Mississippi Valley Medical Journal* for November, 1918, states that the patient should be instructed to keep off her feet as much as possible, as motion of necessity increases the irritation of the affected parts. At times, in mild cases, nothing more is necessary than to keep the parts cleansed with any of the mild antiseptic solutions, thoroughly drying the condylomata and dusting with a bland powder, like compound stearate of zinc. Every possible means, however, should be used to lessen the specific discharge, for as long as this remains there is a tendency for the continuation of these warty growths. Sterile pads should also be worn by the patient, and when soiled should be burned. The foregoing procedures must be repeated with sufficient frequency to keep the parts continually dry if our efforts are to be effective.

Unfortunately, however, this mild form of treatment usually does not cure and it becomes necessary to resort to more stringent measures. One reason for this may be that the patients in whom this condition is most frequently encountered are of the very type who, outside of hospital restriction, do not carefully follow instructions

and do not practice proper personal care. However, even in those cases in which the patients do follow instructions, quite often more radical measures are necessary in order to effect a cure. If the growths are few in number, one need only, after careful surgical preparation, remove them with a sharp knife or scissors and touch the base of the growth with 10- to 20-per-cent silver nitrate solution or 50-per-cent carbolic acid followed by alcohol; or with fuming nitric acid; acetic acid; cupric sulphate or even thermocautery.

Before applying any of these cauterants, the surrounding parts should be well protected with vaselin or some other insoluble ointment to prevent the extension of the escharotic action of the chemicals. This operation can be performed under local anesthesia, his choice being a combination of novocaine and adrenalin, or by freezing with ethyl chloride. According to Schien, the growths are frozen with ethyl chloride every third day, with the result that the growths dry up and fall off in consequence of thrombosis and obliteration of the blood-vessels. In Jeager's experience, the results from simple freezing have not been very encouraging.

Entire removal of the tumors and cauterization of their bases with the thermocautery is, in the main, as efficient as first cutting the tumors away with knife or scissors and cauterizing the bases with chemicals. When the condylomata are more profuse and dense even this plan of treatment is unsatisfactory, and still more radical measures must be instituted. When a cutting operation is performed it should really be radical. The entire condylomatous arc should be completely removed. In doing this, care must be exercised to make the encircling incision in the healthy tissue, for if this is not done and the line of incision is too close to the warty growth, one might leave behind small particles of vegetation which are readily overlooked, thus forming nidæ for recurrences. After the masses have been thoroughly and completely removed, the tissues should be brought together with retaining sutures. Owing to the tension of the parts, Jeager has found that plain or chromicized catgut is insufficient, and he usually closes the line of repair with horsehair sutures.

The after-treatment of these cases is extremely important, for owing to the location, contamination by vaginal, urethral or rectal discharges may readily occur, and when secondary infection supervenes it is exceedingly stubborn and persistent. In preparing the patient for the radical operation, soft-soap poultices should be applied for several days prior to the date set for operation.

If the excrescences are small, painting them with pure lactic acid or with strong solutions (Watson's lactic acid method) will usually, it is stated by Watson, cause the growths to drop off within a short time. Large vegetations must be kept isolated and surrounded by strips of lint saturated with ½- to 1-per-cent lactic acid, and at intervals the base of the tumor is touched with the pure acid. When the vegetations are spread over a considerable area, a wet dressing of a weak lactic acid solution should be applied and changed frequently. A sitz-bath should be taken each time after the dressing is changed. Although in some cases an erythema may take place, one has nothing to fear, and it may be avoided by discontinuing treatment every third or fourth day and by protecting the adjacent parts with vaselin. This treatment is effective in from two to seven weeks, but a cure should not be expected unless such measures have been instituted as will check all previous discharges present.

Jeager has on several occasions, in pregnant women, shortly before delivery, or in women during the lying-in period, in whom he felt that the radical plan of treatment was unwise, injected the bases of the condylomata and a narrow zone of healthy tissue around them with a 1:5000 adrenalin solution, repeating the injections every forty-eight to seventy-two hours, and the results have been quite satisfactory. Care must be exercised not to use too strong a

solution or to inject too frequently or too deeply into healthy tissue, as extensive sloughing has been known to follow injections of adrenalin solutions.

In his early years of practice when his surgical enthusiasm overbalanced his surgical judgment, he did not hesitate to perform the radical operation for the removal of these tumors in pregnant women near the time of delivery, feeling that their presence was a menace to an aseptic puerperium, or in women during the lying-in period, but soon ceased to do so, for in every case so treated he obtained unfailingly bad results. Infection invariably occurred and healing of the tissues was delayed for months. Within the past two years he was compelled to operate on a young woman seventeen years old, two weeks after delivery, in whom the condylomatous masses had attained enormous size, involving completely the vulva, perineum, and anus, and growing into the vagina and rectum, thus causing considerable pain and annoyance during defecation. In this case the lochial discharge was also retained owing to the presence of the tumor in the vagina, and toxic symptoms became manifest. The operation was not a matter of choice but one of necessity, and regardless of extreme care in attempting to keep the parts clean, the postoperative infection was so severe that healing was not complete even after the lapse of six months, and in this case at least the remedy was worse than the disease. In those cases in which condylomata complicate labor or the lying-in period, his experience has taught him that palliative treatment is the best. He has obtained cures in cases in which the growths were not too profuse by the injection of adrenalin solutions, frequent irrigations with antiseptic solutions, antiseptic dusting powders, and sterile dressings. He has recommended the Roentgen ray in some cases after delivery, especially those in which the vegetations were profuse, and feels that it is useful.

Electrolysis, fulguration, high-frequency current, radium application, etc., have all been spoken of as successful methods, but it will be found that all methods are more or less unsuccessful unless thorough cleanliness and diligent measures to stop the gonococcus discharge are continued after removal of the growths..

VACCINES IN THE TREATMENT OF EAR INFECTIONS.

MAITRA, in the *Calcutta Medical Journal* for September, 1918, states that the cases may be grouped under the three following headings:

1. Fulminating cases ending in meningitis or other intracranial mischief or where serious complications speedily occurred, preventing a careful and detailed study, from a bacteriological point of view, of the causative organisms. In such cases no opportunity was obtained for autogenous vaccine treatment.

2. Acute cases with considerable constitutional disturbances, rise of temperature, and local pain. There was much edema around the ear, but usually more marked over the mastoid and the preauricular portions. There was actual pitting on pressure in several cases. Smear and cultural examinations showed staphylococcus aureus in the majority. In a few cases streptococci were found. In some of these latter the tonsils were found to be in an unhealthy condition. In two such cases mastoiditis supervened, and in one of them an operation had to be performed, while in the others the diseased process stopped under treatment. Only rarely both staphylococci and streptococci were found together. Of the patients receiving autogenous vaccines the staphylococcal cases behaved very well. With each dose of vaccine a general improvement was noticed, and by the time the third dose was given a decided progress was made in every instance. Only exceptionally a moderate reaction was obtained after the second or third inoculation. The excruciating sharp pains ceased, the temperature dropped to normal, and the discharge, which at first

changed its character, gradually got less and less and ultimately disappeared. All the staphylococcus cases made uninterrupted recoveries. In only one case did he have to see it the next year for trouble in the other ear. The patient has now kept quite well over eighteen months.

The streptococcal cases were fewer; but in some infection up the Eustachian tube was evidently the channel. The glands were more involved in this group. Most of the cases recovered under treatment, but a few of them had a protracted course. In this group a culture from the infected tonsils, if present, is of advantage.

The initial dose for an adult in a case of staphylococcus infection varied from 100 to 250 millions according as the case was febrile or afebrile, gradually worked up to 1000 millions weekly; the latter dose may be repeated two or three times. In the case of the streptococcus, two minims of a vaccine made from an over-night pure growth of streptococcus to which 5 Cc. of sterilized normal saline is added and heated for an hour at 60° C. was usually the first dose, gradually worked up to half and then to 1 Cc.

3. Lastly a miscellaneous group of cases comprising:

(*a*) Cases showing bacteria other than the preceding groups.

(*b*) Cases with old perforations and subsequent infections.

(*c*) Tubercular group.

The findings in (*a*) were the B. pyocyaneus mostly. These were all chronic cases with plenty of discharge from the ear. In smears other organisms were found to be present in a few instances. In these cases no evidence of acute inflammation was to be found, nor did the patients complain of much pain.

Results of treatment with vaccines made from these cases has not impressed him very favorably. Latterly he thought it worth while in cases other than staphylococcus and streptococcus infections to see whether the patient's serum agglutinated the bacteria, but he could not get definite indication of agglutination. A small initial dose of not more than 5 million bacilli, gradually increased, may be tried where, on repeated cultures, no other organism can be obtained. Two cases have done well so far, after a prolonged course of treatment. In one case on two occasions, after each inoculation, a faint greenish appearance around the site of inoculation developed, as in ecchymosis, which however cleared up in about a week. Coliform bacilli are rarely to be found. He recalls two cases in which B. coli was obtained along with staphylococcus and streptococcus. Pure growth of B. coli has so far not been obtained. Diphtheroids and other unknown organisms are occasionally to be found in the culture tubes. Probably these are contaminated conditions and scrupulous care should be taken to isolate the true causative agent.

In (*b*) old perforations which are favorite resorts for pathogenic and extraneous organisms to coexist, inoculations are advised only of the vaccine made of known organisms and when they are obtained on repeated culture.

In (*c*) tuberculous children suffering from perforation and chronic infection, the staphylococci and pyocyaneus were occasionally tried with varying results.

He states that his cases were never syringed. Only a mixture of boracic acid, glycerin and distilled water with a little alcohol was used to facilitate cleaning of the accumulated pus. In some hydrogen peroxide was used. The patients were invariably instructed to lie on the side of the affected ear, so far as possible, to insure good drainage. An antiseptic mouth-wash was at times given and hot fomentations were advised to relieve pain.

Maitra's conclusions are:

1. The fact that local medication in infections of the ear fails to prevent recurrences has been found to be true in a considerable number of cases; and as dangerous complications occasionally result from such cases, entailing loss of life from the inflammation spreading into the bone, meninges, or the brain, one naturally stops

to think of the value of vaccines. They have done positive good in preventing recurrences and hence have seemed to him of distinct value.

2. That the staphylococcus aureus cases with considerable local edema, fever, and general disturbances have, with a single exception, been successfully treated, and some of whom have remained well one to three years.

3. That the streptococcic cases are also suitable for treatment, and further study will it is hoped prove interesting.

4. That the B. pyocyaneus cases did not produce impressive results.

5. That the cases in group 3 require considerable time, patience, and repeated cultural examinations, although in a few cases good results have followed.

6. That when a bacillus has been isolated on repeated attempts, even if it happens to be a known organism, it appeared to be of definite value to do a modified Widal with the patient's serum before deciding on administering vaccines made from it.

When a papillomatous growth is found to exist in cases of long standing, obstructing a part or whole of the meatus, the earliest opportunity ought to be taken to have it removed with due care.

COMPARATIVE VALUE OF RADIUM AND ROENTGEN RADIATION.

Boggs, in the *American Journal of the Medical Sciences* for November, 1918, states that sarcoma in the nasopharynx is much more amenable to radium treatment than carcinoma. Sarcoma, even in cases in which half the throat is filled with the growth, will frequently disappear in from four to six weeks after radium treatment. One such patient whom he treated with radium has remained well two and a half years. This is really renarkable, because his throat was almost filled with a mass and he could scarcely swallow or speak above a whisper. He had another patient in whom the sarcoma started in the tonsil; three operations had been performed, and within five weeks after the last operation there was a recurrent mass which filled two-thirds of the throat. Within six weeks after radium treatment the growth had entirely disappeared. Did time permit he could report quite a number of similar cases. In most of these cases, however, the time elapsed since the treatment was given has not been sufficient to warrant these being called more than clinical cures.

While, as before stated, carcinoma of the mouth and throat is not so amenable to radium as is sarcoma, still some results have been obtained. For the sake of description he calls the lesions which are very superficial, epitheliomas, and those which have invaded the deeper tissues, carcinoma. If ulceration is confined to the superficial layers of the buccal mucous membrane and has not spread to the teeth one application of radium will frequently heal the lesion. But if the ulceration has to any extent invaded the muscle tissue it is very resistant to radium treatment. Such cases should be given sufficient radiation to produce a marked reaction. This will usually disappear in from two to four weeks; then electric coagulation should be employed rather than a repetition of radium. This will usually heal promptly, leaving very little scarring and no contraction of the surrounding tissues. If the gums are involved the teeth seem to act as an irritant and the cancerous process spreads readily, but if they are extracted it seems to only aggravate the condition.

What has just been said in regard to the buccal mucous membrane will apply to the tongue, except that the muscle tissue is earlier infiltrated, and the glands are earlier invaded.

The treatment of carcinoma of the breast by the Roentgen rays has been carried out by many during the past fifteen or sixteen years and is to-day a recognized method in the treatment of postoperative cases, recurrent and metastatic, primary inoperable and primary cases that cannot be operated upon. For a long time it was taught and accepted as a truth beyond dispute that the only

proper and scientific method was the radical operation; that is, the immediate surgical extirpation of the growth even in the hopeless stages. But things are rapidly changing, and to-day it must be recognized that surgery which was taught for so long as the only method is really only part of the treatment. And while operation still holds first place in the early cases, even at this stage it should be supplemented by Roentgen therapy. This sentiment is spreading among some of the leading surgeons who, in the past, did the most radical operations for cancer of the breast at any stage, and it springs mainly from comprehensive experience with a great number of cases traced out carefully to their end-results. Roentgen therapy is taking the place of the ultra-radical operation, such as removal of the supraclavicular glands or the clavicle.

The treatment of carcinoma of the breast by the Roentgen rays has, comparatively speaking, passed through the same stages as surgery. The early stage might be compared with surgical treatment of a quarter of a century ago when surgeons amputated only the breast. Our technique in the beginning was very crude; we neither used filters nor had a standard dose, and we omitted important chains of lymphatics in which metastases frequently occurred. Indeed, it is quite remarkable that a creditable number of good results were obtained when one considers the inefficient equipment and faulty technique which were employed.

All roentgenologists agree that each case should have a full physiological dose or all that the skin will stand, not only to the anterior chest wall, but to every chain of lymphatics draining the breast as well as to the opposite side of the body. The location and stage of the tumor as well as the kind of operation performed, and the physical condition of the patient, must be considered carefully in deciding on the treatment. Boggs believes from two to three times the usual dose of radiation can safely be given in the supraclavicular region and in places in which there is no scar, and in which the cutaneous circulation has not been interfered with by the operation. A study of the supply of the lymphatics and the manner in which they undergo metastasis should be made by every one treating carcinoma of the breast. This will never be done by the non-medical technician. In fact, too little attention everywhere has been given to the supply of the lymphatics, their depth and extent, and the best manner of thoroughly radiating each chain. Raying the lymphatics sufficiently to the proper depth and as extensively as metastases take place is indeed no easy task. It requires just as much care and judgment as the most careful dissection. Efficient radiation makes operation more radical, increases the percentage of cures in early as well as in more advanced cases, and delays recurrence in all cases.

IRRITABLE HEART OR EFFORT SYNDROME.

SMITH and BOVAIRD, in the *American Journal of the Medical Sciences* for December, 1918, summarize their inferences as follows:

1. The irritable heart or effort syndrome cases constitute a symptom-complex rather than a definite disease. It seems clear there is no definite disease of the heart, and we agree with Lewis that it is highly desirable to avoid any terminology which suggests that there is.

2. The affection is not peculiar to soldiers, but often precedes entry into service, though it may be exaggerated or in some cases produced by the active exercise or vicissitudes of the military life.

3. Occupation in civil life is as much a result as a cause of the disturbance, in that men who know their weakness usually adopt an employment suited to it.

4. In the great majority of cases no definite cause of the disorder is ascertainable. When such can be found it is most often an acute infection.

5. Tobacco, alcohol, coffee and tea, though possible causes of aggravation of

the symptoms, cannot be regarded as prime factors in the causation.

6. Hyperthyroidism is suggested in some of the cases, but if present it is in a mild degree, and there seems no valid ground for regarding it as more than a contributory factor.

7. In the light of the experience now available in the studies of DaCosta and the British Commission it would seem wise to retain many of these patients in the hope of rendering them fit for duty of some kind. In view of their very limited usefulness in foreign service they should not be sent abroad.

8. For the present, at least, the line of treatment must be that of progressive physical training as laid down by the British Commission, which, even if it fails to produce satisfactory therapeutic results, offers the best means of classifying the men as to their physical ability to perform military service.

A CASE OF ASPIRIN HABIT.

MACHT, in the *Medical Record* of November 2, 1918, reports a case which is deemed interesting from the pharmacological and therapeutic point of view and at the same time is rare:

Mr. D. M. S., thirty-seven years old; white; married; occupation, teacher. He complained of pain in the right leg. There was nothing of note in the previous history and family history; no history of lues.

The symptoms date back to three years ago, and began with pain in the right shin bone with gradual thickening of that bone. The patient complained of a constant pain of a gnawing or aching character experienced both by day and night, and consulted a large number of physicians without much satisfaction to himself. Careful investigation of the case led to the diagnosis of a chronic periostitis and osteitis of obscure origin. Repeated Wassermann tests were always negative; *x*-ray examinations and microscopic study of a piece of resected bone excluded neoplasm (sarcoma).

The patient was found to be pale and under-nourished, very neurotic; heart and lungs were normal; blood-pressure rather low, 105/70; abdominal examination revealed nothing remarkable. The right shin bone (tibia) was found to be slightly thickened, not tender and not inflamed. There were no skin eruptions. The urine was negative for albumin and glucose.

Therapy.—The most interesting feature about the above case was the treatment employed by the patient for the relief of his pain. About two and a half years ago he found that a tablet of acetyl-salicylic acid (aspirin), 5 grains, gave him distinct relief, and he therefore continued to take the drug for the relief of his symptoms. It was found by him at the beginning that one or two five-grain tablets were sufficient to keep him comfortable the whole day, but very soon habituation was noted and the patient had to increase the dose. For the past two years he has been taking from five to twelve tablets of aspirin daily; in other words, from 25 to 60 grains of the drug have been consumed by the patient every day for nearly two years. The writer is not aware of any other instance on record in which a patient has taken such large quantites of acetyl-salicylic acid over so long a period of time. It is remarkable that in spite of the enormous quantity of the drug consumed, very few toxic symptoms have been noted by the patient himself or found upon physical examination. The only features of a slightly abnormal character found were obstinate constipation, slight digestive disturbances, and a rather low blood-pressure.

EFFECT OF ADRENALIN ON MUSCULAR FATIGUE.

GRUBER and KRETSCHMER, in the *American Journal of Physiology* for November, 1918, state that adrenalin (0.5 to 1 Cc. of a 1:1000 solution) counteracts the induced fatigue produced by the perfusion of fatigue substances such as sarcolactic acid, lactic acid, and acid potassium phosphate through the muscle in identically the same way as

it does the fatigue produced normally in active muscles.

Adrenalin in some cases has no bettering effect. In these muscles it also has no ability to produce vasoconstriction.

THE RELATIVE EFFICIENCY OF THE MERCURIAL PREPARATIONS IN CONGENITAL SYPHILIS IN INFANTS AND CHILDREN.

RAMSEY and ZIEGLER, in the *American Journal of Diseases of Children* for November, 1918, state that from a small series of experiments they have drawn the following conclusions:

In infants and children, mercury, when given by the mouth, by inunction, or intramuscularly, is excreted at least partly by the urine.

In new-born infants and older children mercurial ointment when placed in contact with the skin, without any friction being used (protected and sealed by wax paper from being volatilized and inhaled), is taken up by the skin and excreted in the urine and continues to be excreted in the urine for a variable time after all treatment has been discontinued.

By inunction (with rubbing) mercury is readily taken up by the skin and eliminated in the urine and continues to be eliminated for a considerable time.

When one inunction is given, the maximum daily amount of mercury is usually eliminated during the following twenty-four hours, smaller amounts being eliminated for a variable time.

Where continuous inunctions are given there is an accumulation in the system and considerable amounts are eliminated at intervals with only traces between.

It is therefore probable that it is unnecessary to have mercury in contact with the skin, either with or without rubbing, as often or as long as has been generally thought necessary. This, however, must be determined by further clinical investigation.

Mercury salicylate suspended in oil and given subcutaneously continues to be eliminated in the urine in appreciable amounts for eight days, or longer, the daily amounts eliminated varying widely. It is therefore probable that a repetition of the treatment, not oftener than at intervals of eight days, would be sufficient.

Mercuric chloride by intramuscular method, a favorite procedure in congenital syphilis, continues to be eliminated for eight days or longer.

In all cases in which mercuric chloride was used either by mouth or the intramuscular method protein was found in the urine.

Calomel, 0.016 gm. every two hours for four doses, and gray powder, 0.03 gm. every three hours for three doses, continued to be eliminated in appreciable amounts in the urine for as long as nine days; the maximum daily elimination usually occurred during the twenty-four hours following administration. It is therefore probable that the daily use of any of the mercurial salts in the amounts usually prescribed is unnecessary and presumably harmful.

THE TONSILS AS FOCI OF INFECTION IN STREPTOCOCCUS HEMOLYTICUS CARRIERS.

NICHOLS and BRYAN, in the *Journal of the American Medical Association* of November 30, 1918, conclude that:

1. The tonsils are the principal foci of infection in throat carriers of *Streptococcus hemolyticus*.

(*a*) Cultures taken from different parts of the nose, mouth, and throat show more streptococci in the tonsils than elsewhere.

(*b*) Cultures from excised tonsils show streptococci in 75 per cent of cases.

(*c*) Crypt cultures show a higher percentage of positive results than surface cultures.

(*d*) Excision of the tonsils renders the throat negative in nearly all cases.

2. The streptococci isolated from tonsils and throats show no cultural difference on sugar mediums from those obtained from empyema fluids.

3. Excision is the only radical method of curing carriers of the infection.

(*a*) Dobell's solution, dichloramine-T and hot alcohol had little better effect than no treatment.

(*b*) Silver nitrate, 25 per cent, gave the better results in negative throat cultures, but the crypts frequently remained positive.

4. The presence of hemolytic streptococci in pathologic tonsils is an additional reason for their removal.

THE OPAQUE MEAL VERSUS THE STOMACH TUBE IN THE DIAGNOSIS OF GASTRIC HYPOMOTILITY.

LEVY, in the *American Journal of the Medical Sciences* for December, 1918, states that two years ago he reported, with Dr. Kantor, 185 cases of delayed gastric emptying occurring in an unselected series of 1600 patients with digestive symptoms. He is now able to report 1000 additional cases studied both with the tube and the Roentgen rays.

After a complete history and physical examination the patient presents himself in the morning fasting. The tube is introduced and the contents aspirated. The Ewald test breakfast is then administered and extracted one hour later. Occasionally the Rehfuss fractional method is employed. The Roentgen-ray examination follows. The meal consists of 100 gm. of barium sulphate in 500 Cc. of buttermilk. The usual fluoroscopic and radiographic examination is made, and the patient instructed to return in six hours, and warned not to eat or drink in the interval. On the following day he is requested to eat a regular meal consisting of meat, potato, bread, and some light dessert, the quantity to correspond with what he usually consumes at dinner, and to present himself seven hours later, not eating or drinking in the interval. The object of the visit is not disclosed so as to eliminate the psychic factor. The tube is then introduced, the contents aspirated, and the stomach washed out. As the stomach should be empty at this time the amount of residue determines the degree of motor disturbance.

Analysis of the 1000 cases showed hypomotility, with the opaque meal, 100 times; with the tube, 141. In no single instance did they fail to find some food in the stomach with the tube when any of the opaque meal was visible six hours after. Occasionally the tube test was less than the opaque meal test indicated. On the other hand in 41 cases the tube gave evidence of delayed emptying when the Roentgen-ray method failed to discover any residue. As a rule these cases are of the milder forms of motor disturbance. However, there were nine cases in this group with a typical duodenal ulcer history. Two of these were verified at operation. There was one case of gastric ulcer also proved at operation. There were eight cases of chronic appendicitis; four of these were operated and the diagnosis verified. He believes that chronic appendicitis is very frequently associated with a mild form of hypomotility sufficient to give a moderate seven-hour rest with a Riegel meal, but none with the six-hour opaque. But besides these 41 cases there were 22 others that gave but a minimum six-hour Roentgen-ray test in which the tube showed a large test—in one case as much as 800 Cc., and in a number of others over 150 Cc. From the above study he concludes that the seven-hour tube test is superior to the six-hour opaque meal method as practiced by roentgenologists in the diagnosis of gastric hypomotility, for in 28 per cent of the cases it gave evidence of a rest not discovered by the Roentgen-ray method, and in 17 per cent more it showed a marked hypomotility when the Roentgen-ray method indicated but a slight disturbance. In both groups there were a number of surgical conditions.

He states that he is aware that these conclusions are not in accord with those of Carman and Miller of the Mayo clinic. They state that "During the year 1914, 950 patients who had been examined both by the Roentgen-ray and the test meal went to operation; 220 of these, or 23.1 per cent, showed a gastric residue at the Roentgen-ray examination from the six-hour meal; 131, or 13.7 per cent, had food remnants.

In other words, the Roentgen ray showed approximately 70 per cent more retentions than did the clinical test meal."

In attempting to explain the discrepancy between the tube and Roentgen-ray findings, Carman and Miller say: "It would seem probable the time elapsing between the ingestion of the gastroenterologist's meal and its withdrawal is too liberal and pathological hypomotility is excited." Levy believes this explanation hits the nail on the head. It is hardly just to compare a six-hour opaque meal residue with a fourteen- to sixteen-hour tube one. A stomach may suffer from a decided degree of hypomotility and yet manage to empty itself during the night. The six-hour opaque meal and the "fasting contents" test may be sufficient to detect gross surgical lesions, but they are not delicate enough for all clinical purposes. For the clinician, even in the non-surgical conditions, it is important to recognize these cases of hypomotility, as they give rise to definite symptoms. The stomach should be empty of one meal before the next is introduced. The healthy stomach is capable of a great deal of abuse. It can tolerate a second meal on top of the previous one. However, the digestive juices at the end of a meal are not quite the same as at the beginning. In a stagnating stomach six or seven hours after a meal the contents are decidedly abnormal. There may be fermentation, the odor is frequently foul, and rancid and abnormal products of digestion formed. Pouring fresh food into such a stomach at once leads to the souring of the fresh meal. These patients suffer from fulness, belching, and a variety of toxic symptoms. They believe the food eaten at the last meal responsible for their distress. It is not the last meal but the remains of the previous one that produce the symptoms.

Harmer and Dodd call attention to the difficulty of always emptying the stomach with the ordinary tube, but, despite their contention, it is Levy's opnion that with a properly constructed tube, a proper technique, and a bulb extractor the stomach can, with very rare exceptions, be emptied of its contents.

It might be suggested that the Roentgen-ray method could be made more delicate by shortening the emptying time from six to four hours or even less. Or the Roentgen-ray method might be combined with the Riegel method as suggested by Cole. He says: "In a previous communication I have already shown the fallacy of testing the gastric motor efficiency by administering bismuth suspended in fluid or mixed with cereal, and the same is true for intestinal motor efficiency. If the test is to be of value the stomach and intestines must be called upon to evacuate such a meal as is normally imposed upon them. Therefore the true test of gastrointestinal motor efficiency is made by administering bismuth or barium, suspended in fluid, but preferably buttermilk, in conjunction with a Riegel meal of meat, potatoes and bread."

To shorten the Roentgen-ray method he believes would be unwise, as roentgenologists, as a rule, are rather more particularly interested in the discovery of actual lesion than functional disturbances. Too much surgery is now being done on misinterpreted Roentgen-ray evidence, and to shorten the time would increase the evil. He is in accord with Bassler, who states: "It is apparent, whatever has been advanced to the contrary, that the method of examination by food extraction is decidedly more to be depended on in gaining an idea of exit from the stomach than is the bismuth Roentgen-ray method." But the most serious objection to the opaque meal as a test for hypomotility is that these salts do not enter into the human dietary. For practical purposes it matters very little how long these substances remain in the stomach. It would seem more rational to test its motor function by giving the patient a meal he is in the habit of eating. If the Roentgen-ray method simply determined the length of time that an opaque meal remained in the stomach its use could entirely be dispensed with. This could be determined just as well with the tube and the patient spared

the expense and the physician the danger of Roentgen-ray exposures. To accomplish this it would only be necessary to substitute the Rieder meal for the Riegel. The opaque meal could be administered as for Roentgen-ray work. The tube could be introduced six hours later and the amount of opaque salts remaining could actually be measured and weighed; or, better yet, the fractional extraction method of Rehfuss could be used and the exact time the bismuth remained in the stomach determined.

But the tube tells us more than that a residue is present. From the character of the residue we learn whether the patient masticates his food thoroughly; just what food is difficult for him to expel; whether abnormal products of digestion are present; whether fermentation is taking place; and whether there is hemorrhage—all this information is easily obtained and is valuable in diagnosis and treatment.

It is not Levy's intention to belittle in any way the importance of the Roentgen-ray diagnosis of gastrointestinal conditions, nor does he advocate disregarding the Roentgen-ray evidence in hypomotility. It is his purpose to emphasize that a rational test for gastric emptying should be based on a meal of ordinary bulk and complexity which the patient should dispose of in seven hours, and that the Roentgen-ray test as commonly practiced is not sufficiently delicate for many clinical purposes.

INSTRUCTIONS FOR THE USE OF SERUM FOR LOBAR PNEUMONIA.

CAMAC, in the *American Journal of the Medical Sciences* for December, 1918, gives this advice:

To desensitize: (*a*) Administer 2 Cc. of serum subcutaneously and at two hours' interval administer the following amounts: 3 Cc. and 5 Cc.—a total of 10 Cc. After each administration look for signs of hypersensitiveness, such as: (1) Difficulty in respiration; (2) cyanosis; (3) violent coughing; (4) sense of constriction about chest; (5) marked variation in pulse. In case these occur give same dose as previous one at the end of two hours' interval. (*b*) From two to four hours after the last desensitizing dose, administer the balance of the 100 Cc. intravenously. (*c*) Administer 100 Cc. intravenously every twelve hours. The intravenous administration of serum, warmed to body heat, should be by gravity, and very slowly. In case of signs of hypersensitiveness, as noted above, occurring during the administration of serum, stop the serum at once.

Serum sickness is not a serious condition and does not contraindicate the continued administration of serum, though it is due to the serum.

The manifestations are fever, itching and redness of the skin, urticaria. This condition is entirely different from true anaphylaxis, which in mild form would be manifested by the symptoms of hypersensitiveness noted above and which in severe form may be rapidly fatal.

ABDUCTION TREATMENT OF FRACTURE OF THE FEMORAL NECK.

WHITMAN (*Surgery, Gynecology and Obstetrics*, December, 1918) observes that it is as a routine treatment for all types of fracture of the neck of the femur that the details of the abduction method are now presented.

The patient clothed only in fitted shirting or a combination suit of underclothing, having been anesthetized, is lifted to a pelvic rest screwed to the end of the table and provided with a perineal bar for counter-pressure, the shoulders resting on a box of equal height. The limbs, extended and side by side, are each supported by an assistant. Direct manual traction on the limbs is then made by the assistants against the resistance of the perineal bar, while the surgeon, standing on the injured side, lifts the thigh upward, guiding the trochanter to its normal position.

When the shortening has been reduced as demonstrated by comparative measurements, the limb, which is usually rotated outward, is turned until the patella points slightly inward. The two assistants, still

exerting equal traction on the limbs, then abduct them, that on the sound side slightly in advance, in order to demonstrate the normal range and to balance its fellow, so that the tension on the capsule as the fracture is adjusted may not tilt the pelvis upward. A final inspection shows the extended limbs equally abducted on a level pelvis with all the landmarks corresponding. Attention is again called to the order of the manipulation; direct manual reduction of the shortening and outward rotation precede the abduction.

The so-called impactions are usually reduced as easily as those that are evidently complete, resistant cases being far more often encountered in early life, when the fracture may be incomplete or of the epiphyseal type. The impacted fracture has lost its former significance, because in the classical form it is rare, and because the abduction method assures reduction without violence, supplemented by immediate and secure fixation.

The typical attitude in which the limb is fixed after adjustment of the fracture is one of complete abduction, complete extension, and slight inward rotation. The knee is slightly flexed, and the foot slightly adducted in a right angular relation to the leg.

In the application of the spica the body and limb are first carefully protected by bandages of sheet wadding and cotton flannel made especially thick about the upper part of the chest, the pelvis, and the sacrum. The plaster support should extend from the nipples to the tips of the toes. It should be thick and unyielding about and below the joint, completely covering and enclosing the buttock.

The spica should be cut to permit the full flexion of the other thigh. If the patient complains of constriction of the chest it may be split at the top, or an opening made over the abdomen. Another covering of shirting is drawn over the plaster and sewed to the first, thus binding the margins with soft material.

As had been stated, the purpose of the support is to assure anatomical rather than direct splinting. The long spica is most effective because the leverage above and below the joint is fairly equal. The limb is hyperextended in order that the strong anterior wall of the capsule may be made tense and because support in this position checks any tendency to backward displacement of the outer fragment to which the force of gravity predisposes. Slight flexion at the knee reduces the strain on the joint, and the inward rotation follows the principle of overcorrection of the preëxisting deformity. When the plaster is firm the patient is placed in bed, the head of which has been raised a foot or more by blocks. This inclination compensates for the pillow and is in contrast with the elevation of the foot of the bed, as is usual when traction is employed.

If the plaster spica has been properly applied and adjusted it is far more comfortable than any appliance that, like traction, requires rest upon the back. The patient is turned at intervals to the side, or completely over, to relieve the pressure, or even moved from place to place without discomfort. Thus, hypostatic congestion and bedsores are prevented.

Long spicas are also applied extending above only to the umbilicus. These are far less effective as supports and are usually less comfortable than those in which the leverage above and below the joint is more nearly equal.

The apparatus required in applying the treatment is of the simplest description and can be easily obtained or improvised. The patients are anesthetized to relieve discomfort and because muscular relaxation is essential to complete abduction. Gas and oxygen if skilfully administered answer the purpose and should be comparatively free from danger even in advanced life.

There are exceptional cases of fracture without deformity, and others of actual impaction, in which, although the neck is shortened, its angle is preserved so that fixation of the limb in moderate abduction without anesthesia is all that is required. There is a third group, in which because of

the condition of the patient the treatment has to be modified.

The plaster spica is retained as a support from eight to twelve weeks, a time sufficient, it may be assumed, to assure adhesion of the fragments, but by no means a resistant union. After its removal the patients remain in bed preferably for several weeks for massage, passive and active movements of the joints, and reëstablishment of muscular control. Several times a day the limb is drawn out by the attendant to the full limit of abduction, otherwise a gradual restriction of its range would be apparent, a clinical indication of the fact that flexion and adduction are the natural accommodations to weakness and discomfort. Weight-bearing, therefore, should never be permitted with the possible exception of certain fractures at the base of the neck, or in childhood, for at least six months and often only after a much longer interval, because repair is slow, and because the strain is much greater than in any other situation. The indications for resumption of functional use are the situation of the fracture, the process of repair as shown by *x*-ray pictures, and above all, by the restoration of voluntary control and the freedom from discomfort on passive movements. Since the period of reconstruction is so prolonged, the use of a caliper hip splint which permits locomotion without direct weight-bearing is desirable; otherwise crutches are employed.

The protection of the weakened bone and joint, which is almost as essential as the primary correction of deformity, has been entirely neglected in conventional treatment, weight-bearing being permitted and encouraged even, within a few weeks or months, with the aim of hastening repair. It is fair to assume, therefore, that the nutritive changes resembling arthritis deformans sometimes observed as later effects of the injury are, like the deformity and the restricted motion incident to it, the consequences of a treatment which from beginning to end is consistently inadequate.

The results, in keeping with its character, are so extraordinarily bad that they have served thus far to justify the treatment that produced them, on the theory that the outcome was determined primarily by the situation of the fracture, or by the relation of the fragments to one another, or by deficient nutrition, or by other factors over which the surgeon had no control, and that conventional practice was a clinical adaptation to exceptional conditions. Consequently, that efficiency, as it was understood in the treatment of other fractures, even if it were practicable, was undesirable since it might jeopardize the result. This is an argument in a vicious circle, from which there is no escape if one accepts the premises on which it is based. If, on the other hand, one discards inadequate treatment, one of necessity rejects all the conclusions that support it.

The practical point then is, whether efficiency and all that it implies is worth while; in other words, whether opportunity that can be assured only by adequate treatment will favor repair, or whether the result is actually determined by chance.

The arguments in favor of surgical efficiency may be summarized as follows:

That non-union occurs in childhood under the same conditions as in adult life, although there can be no question of the capacity of the tissues for repair.

That repair after non-union is the rule when at open operation the fragments are freshened and adjusted, indicating that fixation in apposition is the first essential of success.

That experience in bone-grafting proves that union is possible under far less favorable conditions, as regards the blood supply, than in fracture of the neck of the femur.

That the obstacles to repair, whether intrinsic or extrinsic, actual or fanciful, that have thus far justified inadequacy and neglect furnish the strongest presumptive evidence in favor of opportunity as the determining factor in the result.

That it has already been abundantly proved by practical experience that repair is possible in every variety of fracture at

the hip and at any age, and although it cannot be asserted that opportunity will always assure success, it is self-evident that want of opportunity assures failure. Consequently, the responsibility for opportunity, upon which the result is primarily dependent, rests upon the one who selects and applies the treatment.

This conclusion, however revolutionary as contrasted with conventional teaching, is in effect simply that surgical principles, whose application has been made practicable by the abduction method, should now govern the treatment of this as of other fractures.

The abduction treatment as the exponent of these principles has made steady progress in recent years. To quote from the *Nouveau Traité de Chirurgie:*

"Cette méthode préconisée par Whitman est à l'heure actuelle partout appliquée."

This encourages the belief that when the treatment is properly presented in the textbooks it will be generally adopted, because the method is efficient, the purpose definite, the effects demonstrable, and the patient under single control.

In other words, because it meets in a comprehensive sense the conditions essential to success, as contrasted with conventional practice, which is lacking in each of those particulars, and which has been so thoroughly discredited by results as to furnish a legitimate excuse for the virtual neglect which has thus far been the portion of these unfortunate patients.

In view of the fact that Whitman has practiced this method for many years and written extensively upon it, Ghillini's contribution (*Policlin.*, Roma, 1918, xxv) is of interest. He says that union of fractures of the neck of the femur is always obtained with deformity. The reason is that no one has observed that when the patient is in the supine position during recovery, the distal fragment of the femoral diaphysis is always in a plane below the central fragment of the femur head in its cotyloid cavity. This low displacement of the inferior fragment has not been regarded as important; but it should be added to the three cardinal symptoms of fracture of the femoral neck. By giving attention to this the author has been able to obtain excellent results. Recovery has been so perfect that doubt was cast on some radiographs which the author showed at the Bologna Congress of Surgery in 1917. Some of these radiographs are reproduced and show the conditions before and after treatment in intracapsular and extracapsular fractures.

The method followed by Ghillini is as follows: The pelvis rests on a support. The limb is held by the foot and leg in order to exercise traction. In the healthy limb and in the injured limb the distance from the superior anterior iliac spine to the great trochanter is measured. An assistant then raises the great trochanter until the distance is the same on both limbs, and it is maintained in this position. A plaster cast is applied reaching from the umbilicus to the knee. The assistant who exercises the traction puts the limb in abduction and internal rotation. While the plaster is consolidating, the operator maintains the raised position of the great trochanter in such a manner that the lower fracture fragment is in perfect position. A Volkmann's traction apparatus maintains the foot in internal rotation. Immobilization continues for fifty days; then kinesitherapy is begun.

The author states that he has always obtained perfect correction of the fracture by this method, and he believes that he was the first to obtain these perfect results in fractures of the neck of the femur.

THE DIFFERENTIAL DIAGNOSIS BETWEEN CHRONIC GASTRIC ULCER AND CARCINOMA OF THE STOMACH.

Basch (*New York State Journal of Medicine,* November, 1918) thus summarizes his conception of a differential diagnosis. The importance of correct diagnosis in gastrointestinal diseases cannot be overestimated, for thereon necessarily depend prognosis and proper therapy. Previous to the introduction of the stomach tube, clinical diagnosis was based almost entirely

upon pathology of structure. With increased use of the stomach tube came interest in pathology of function, and within a short period a vast array of symptom-complexes were discovered and described as disease entities.

Through increasing opportunities for early and more efficient operative procedures, through rapid advancement in pathological, chemical, and roentgenological laboratory methods, as well as more systematic investigation and checking up of clinical material and the standardization of records, and more especially through closer coöperative study in all these lines of medical pursuit, we are daily acquiring valuable and definite knowledge in these complex problems of gastrointestinal disease.

Of all the affections of the stomach none has been more frequently the soure of erroneous diagnosis than ulcer. This is not surprising since the stomach is so intimately associated through nerve paths with other organs of the body; and the reflex motor and secretory disturbances excited by extragastric conditions are common manifestations, too, of ulcer.

In no other disease of the stomach is this confusion in diagnosis with ulcer attended by such serious consequences as in gastric cancer. The exact pathologic relationship between chronic gastric ulcer and cancer is still an unsettled problem and is foreign to the purposes of this presentation. Evidence is, however, gathering rapidly that the clinical relationship between chronic gastric ulcer and cancer is of greater frequency than has been supposed. This is not surprising in view of the fact that most cases of ulcus carcinomatosum are found in ulcers of long standing and in individuals who have reached the age of cancer predisposition.

Since the differential diagnosis between the two conditions would necessarily and chiefly depend on our ability to diagnose straight ulcer and straight cancer, it would be best first to briefly recall the chief clinical characteristics of these two diseases.

Chronic gastric ulcer is an affection of long standing (six months to forty years, averaging twelve years), found most frequently during the third decade of life, and manifesting itself in gastric distress or pain, which in the early cases is periodic and usually in direct association with food ingestion and the degree of gastric acidity, while in advanced and complicated cases it tends to become more frequent or even continuous. There are present also epigastric or dorsal point tenderness, often vomiting, the vomitus or stomach content usually having a high degree of acidity and not infrequently containing visible or chemical blood. In advanced cases are often found products of gastric stagnation and fermentation. As a rule there is an excessive desire for food, frequently, however, associated with sitophobia, or fear of eating. Except during acute attacks or in the advanced or complicated stages, the general nutrition suffers but little.

Gastric cancer is an affection of middle or advanced life, of short duration, with a continuous and rapidly downward progressive course; often with no previous history of gastric complaint, though not infrequently there is a precancerous history of catarrh or ulcer. Gastric cancer is characterized by marked decrease in appetite, weight, and strength, by anemia and cachexia, by gastric distress or pain, not necessarily associated with meals, and by vomitus or stomach contents usually with diminished or absent hydrochloric acid, which is frequently replaced by lactic and other organic acids. The stomach contents often also contain blood, excessive mucus and decomposition products, with stagnant masses and foreign microörganisms. In addition a visible or palpable tumor is frequently present. Occasionally the diagnosis has been helped through the findings of tumor fragments in the vomitus and washed-out stomach contents, especially in the softer types of tumors.

Both these conditions have at times diagnostic *x*-ray characteristics.

It would seem that a positive Wolff-Junghann's test and the presence of the

Boas-Oppler bacilli in the stomach are the most constant laboratory findings in gastric cancer.

Basch knows from personal experience of patients who were explored and closed up because of advanced and inoperable carcinoma, particularly of the fundus and lesser curvature, where *x*-ray examinations made by experts gave not the least hint of the extent, and occasionally even too of the presence, of the growth. The claims of Cole, Stewart, George and others that in the *x*-ray we possess our most valuable means for the early diagnosis of cancer of the stomach can be accepted only after more extended proof.

In this field the *x*-ray finds its greatest value in the diagnosis of the location of the lesion and the nature of any existing complications. In no other way short of operation can the size, form, position, fixity, tone, peristaltic activity, relation to other organs and deformities such as hour-glass contraction, old stomach perforations, peristaltic breaks, etc., be so well diagnosed as with the *x*-ray. This method also gives us definite information of the progress of the diseased condition.

The author concludes as follows:

The clinical relationship between chronic gastric ulcer and gastric cancer is one that must be recognized.

In clear-cut cases the differential diagnosis between chronic gastric ulcer and gastric cancer should present no difficulties, provided due attention is paid to the history taking and the results of the established methods of examination.

Difficulty will always present itself in very atypical cases when the patient is in the cancer predisposed age.

In those very early cases of malignancy associated with chronic gastric ulcer which have no cancer histories, and negative objective signs and gross operative findings indicative of cancer, it is, of course, impossible to establish the presence of malignancy excepting through histological examinations.

When in doubt as to the exact diagnosis, a definite attempt should always be made to place the case into a medical or surgical category. In the latter class unquestionably belong cases with long standing ulcer histories which show recent changes from the original type to one of downward progression.

Cases diagnosed clinically and operatively as cancer, infrequently ultimately prove to be of a benign character. In many cases a very carefully conducted clinical study would have established the correct diagnosis.

BLOOD TRANSFUSION IN THE SMALL-TOWN HOSPITAL—A PLEA FOR ITS MORE FREQUENT USE.

FINTON (*Journal of the Michigan State Medical Society*, November, 1918) observes that the preliminary blood test should always be made for the protection of the patient. This has been emphasized by every writer on transfusion. But the practical point that we have not seen mentioned, a feature that was causing undue hesitancy, was that it made absolutely no difference which particular group (numbers I, II, III, or IV) a donor was in, as long as the patient's serum did not agglutinate this prospective donor's cells. The group classification was very useful in large clinics and medical centers where a number of paid donors were available, but for the operator who has to secure a new donor almost every time he transfuses a patient it is not essential.

Mother's blood may be used to transfuse the new-born without the preliminary blood test. And in extreme emergencies a brother or a sister, or the parent that the patient most resembles, may be used. This is, of course, not absolutely safe, but is justifiable.

This well-known preliminary blood test is very simple, but it might be stated again: Secure two drops of the patient's blood in one Cc. of 2-per-cent solution of sodium citrate in a small test-tube (No. 1); two drops of donor's blood in same manner in

a test-tube (No. II); about fifteen drops of blood from patient and donor in test-tubes III and IV respectively. After centrifuging for a few minutes two platinum loopfuls from patient's serum (tube III) are put on a cover-glass and one loopful of the donor's cells from tube II is added to the serum and the serum-cell drop mixed. It is then examined as a hanging drop. If agglutination is going to take place it usually does so within two minutes, but it is well to shake or jar the glass slide and wait fifteen minutes before discarding. The donor's serum (tube IV) and the patient's cells (tube I) are mixed and examined in the same manner. Agglutination here, however, is not a contraindication to transfusion. So that with no agglutination between patient's serum and donor's cells, this prospective donor may be used for the proposed transfusion. The importance of a Wassermann test on the donor cannot be overestimated and should always be made on all donors.

One essential is required for safety. The serum of the recipient must not agglutinate the corpuscles of the donor. A fatal "anaphylactoid" reaction may follow failure to observe this rule.

The sodium citrate method of Richard Lewisohn is perhaps as satisfactory as any method for the physician who is called on only occasionally to do a transfusion. Here 10 Cc. of a 2-per-cent sodium citrate solution is mixed with every 100 Cc. of blood drawn. The required amount of freshly sterilized citrate solution is put in the receiving flask and the blood allowed to flow into the solution, an assistant constantly stirring to insure prompt mixture and to prevent clotting. It is advisable but not absolutely necessary to strain the blood once through gauze to be sure no clots have formed.

An occasional criticism of the citrate method has been made. Reactions do sometimes occur. But they are usually not severe, and the use of a chemically pure sodium citrate has greatly reduced the degree and frequency of these reactions.

Perhaps more failures have occurred in securing blood and in introducing blood into the recipient's veins by trying to use needles of too small caliber than from any other cause. A good rule is to use the largest needle that will readily enter the vein.

Notwithstanding the advice of some writers to the contrary, the best way to insert the needle is with the bevel down, parallel with the axis of the vein, so that the vein will not be so easily transfixed and the lumen lost. Veins are frequently hit and then transfixed.

As a rule incisions are not necessary. After the needle has been introduced into the vein of the recipient, the use of a universal stop-cock to connect the blood container tube with the needle greatly facilitates matters, and will often prevent the operator from "losing" the vein after the lumen has been entered.

The amount used varies with the age, size, etc. It ranges from 50 to 75 Cc. in infants, to from 400 to 750 Cc. or more in adults.

The procedure is repeated once a week as long as required. The same donor, especially if the amount be large, is not used again as a rule for from four to eight weeks.

The most common indications for blood transfusion are: severe secondary anemia, primary anemia (so-called pernicious anemia), hemophilia, purpura of the newborn, severe systemic infections, especially of staphylococcus and streptococcus types, gas and benzol poisoning. There are a few other conditions for which it has been used.

THE INCIDENCE OF PEPTIC ULCER AND CARCINOMA IN THE DUODENUM.

LICHTY *(New York State Journal of Medicine,* November, 1918) notes that cancer of the duodenum was first described by Hamburger as early as 1746, since which time the lesion has been found only occasionally. Ulcer of the duodenum was first mentioned in medical literature in 1817. In 1830 it was possible to collect only five cases

from the literature, and in 1894—only twenty-five years ago—a thesis by Collins (Paris) contained a summary of 257 cases recorded to that time, and notes of additional five cases observed by him. At present almost any clinician who sees a number of gastrointestinal cases can number his duodenal ulcer ones by the hundreds. It is interesting to note, therefore, that while carcinoma of the duodenum has been known for almost two centuries it is now seen scarcely more frequently than when it was first described.

Ulcer of the duodenum, popularly known, we might say, for only twenty-five years, is now the most frequently recognized lesion in the gastrointestinal canal—even more frequently than ulcer of the stomach.

In reviewing his own cases Lichty has found but six cases of carcinoma of the duodenum, and about 240 cases of carcinoma of the stomach—a ratio of one to forty. The six cases of cancer of the duodenum were all confirmed by operation or autopsy, with the exception of one in which autopsy was not permitted.

Reviewing over 1000 cases of peptic ulcer, there is a diagnosis of ulcer of the duodenum 480 times, whereas ulcer of the stomach was diagnosed 540 times. It was only after visiting the Mayo clinic, some ten years ago, that Lichty appreciated the fact that duodenal ulcer does occur and that many of his so-called hyperchlorhydrias, which formerly had been considered as cases of gastric neurosis or gastric ulcer, were cases of duodenal ulcer. Since then, with more careful histories and with the aid of the *x*-ray, the Einhorn string test, and other procedures, the diagnosis of duodenal ulcer has been made more frequently, and probably now two out of three cases of peptic ulcer are found in the duodenum.

According to Moynihan at least 95 per cent of peptic ulcers lie in the first portion of the duodenum or within one and a half inches of the pylorus. The farther the distance from the pylorus the less frequently is ulcer found. It is unusual to find an ulcer near or about the papilla of Vater.

It is possible to find but few satisfactory reports in the literature of cases of carcinoma of the duodenum located exactly in the most frequent ulcer-bearing area—*i.e.*, within the first one and a half inches of the gut. Most reports seemed to be of growths which come directly from the pyloric ring or immediately from or about the papilla of Vater.

CHRONIC BACKACHE FROM AN ORTHOPEDIC STANDPOINT.

Horwitz (*Journal of the Missouri State Medical Association*, November, 1918) bases his paper upon a study of 125 cases of chronic pain in the lower spine in which a history of trauma can be traced. The symptoms from a traumatic condition leading to pain at the sacroiliac joints in no way differ from those resulting from an internal pelvic strain upon the sacroiliac ligaments. The term trauma need not be limited to external violence, but can and should include injury or abuse produced insidiously, of whatever nature. The constant strain upon the posterior pelvic joints produced by displaced pelvic viscera is as much of traumatic character in respect to the damage caused to the sacroiliac ligaments as would be that of a definite postural or occupational strain upon these joints..

These various causes lead to a complete definite entity, a condition having a definite train of symptoms and yielding to a definite mode of treatment. The treatment benefiting an orthopedic backache will also benefit a gynecologic backache. It is therefore entitled to be classed as a disease and not to be considered as a symptom. Being an entity it should not be degraded by such terms as lumbago, rheumatism, or even sciatica. Rheumatism should be a term for lay use, not medical (at least not scientific). Lumbago is not an entity, but a symptom, at times a part of a myositis. Sciatica is more often a symptom of and a result of a sacroiliac abuse than an entity or cause.

The term "strain" suggests the etiology. It is a condition produced by causes leading

to a stretching of the sacroiliac ligaments. They may be acute, subacute, or chronic in character. Among the acute may be included sudden injuries produced by lifting too heavy a load; lifting a load heavier than anticipated, although in itself not too heavy for that individual; lifting a load of less weight than anticipated, permitting a too sudden assumption of direct posture and consequent strain upon the ligaments; sudden turning of body to one side, as in picking up or attempting to pick up a fallen or falling subject.

Strain is found in the individual accustomed to one definite posture during the working day—the bookkeeper, stenographer, or bench worker.

It is found in the individual who performs constant rhythmic motions involving the spine—the bench worker, the miner, the trench digger.

The individual whose occupation requires constant lifting of objects, even of little weight, such as loading brick, loading coal, etc. In sedentary individuals, allowing relaxation of all muscle and ligamentous tone—the writer. The individual who suddenly changes his mode of living from the sedentary to the active. Strain is not frequent in the active individual, in whom all muscles and ligaments are maintained in the proper tone.

In the female we have a chain of causes supplementing the above. Frequent gestations; delayed assumption of the normal uterine tone after pregnancy; prolapse of uterus.

A frequent cause of chronic backache is the protracted stay upon the operating table. The patient is here placed in an uncomfortable, strained position. Complete anesthesia destroys all ligamentous tone and the lumbar spine and sacrum sag posteriorly. This trauma is slow to recover and permanent injury may result. Those due to a chronic insidious onset are more often bilateral; those of acute origin are usually unilateral.

An overstrained and weakened condition of the sacroiliac ligaments, with subsequent undue mobility of the joint. This motion or rather permissible motion of the broad lips of the joint sets up an irritation with subsequent thickening. Where an acute tearing of the ligaments has taken place or extensive chronic stretching and great mobility results, this friction is of extensive character, and leads or may lead to an actual arthritis. We here see a broadening of the lips of the joint, as compared to those of the corresponding joint; a broad ridge as contrasted to a sharp one, with well-defined walls, not sloping or tapering away gradually into the adjacent portions of the ilium. At times there may be an actual luxation at this joint, simulating a pathological displacement at other joints.

As for symptoms, pain is usually intense in the acute stage, is constant, and aggravated upon movements, both active and passive. In the chronic, pain is greatest in those movements which originally acted as a causative factor. Pain is also noted in a change of position from a relaxed to a contracted attitude. Jarring of the spine, both in walking and riding, produces pain, at times intense. The pain is usually referred down the leg to the knees in unilateral cases, or alternating down either leg in bilateral cases. The history is that of radiating pains, now in one limb, later in the other. The explanation for this is difficult. It may be caused either by a stretched nerve or by pressure.

In those cases of insidious onset the findings are usually bilateral, and the patient stands with the body slightly tilted toward the less involved side, or with body bent slightly forward where the involvement is of equal degree. The lumbar lordosis is diminished and the dorsal kyphosis flattened. Movement of the body is from the hips. In those of acute onset, and where the findings are unilateral, the body is strongly tilted away from the involved side. This tilting of the body is due partly to the desire of the patient to relieve pressure on the weakened side and partly to the uneven contraction and tension of the ligaments of the two sides.

Muscle spasm is seen in those of acute origin only, and is of the same character as seen in all acute traumatisms. The spine, in all acute cases, is rigid, both from muscle spasm and pain. In the chronic, the rigidity and pain resemble that seen in painful flat-foot, caused by relaxation of tarsal ligaments. It is noted more upon use of the part after a period of rest, gradually diminishing upon further use, until exhausted by overstrain. The patient upon rising from a sitting position will frequently catch himself with a sudden sharp pain, and at times be compelled to drop back in his seat. He will frequently give a history of pain and stiffness in the morning, wearing off during the day and gradually coming on toward evening. He cannot sleep on his back, not because of tenderness, but because of actual pain. Placing a cushion under the lumbar spine gives relief. Sitting upright is painful, but less so than when sitting in a slouched attitude.

There is at times actual tenderness, as in the former the weakened ligaments, in the latter the irritated lips, of the joint are the causes of tenderness. The gait is of a slow and careful character, the step short and knee slightly flexed. A long step, or one with knee extended, causes strain upon the sacroiliac ligaments and produces pain.

There is a history of a persistent attitude or a certain definite and frequent spinal motion during an extended period of time with gradual onset of pain. This pain demonstrates itself at first upon the rising position, but later becomes more constant and is seen in all motions of the lumbar spine. It is seen in individuals of sedentary life, in individuals whose work consists of certain rhythmical motions of the body in flexion and extension, in individuals who change from a sedentary to an active life. They complain of pain in the lower back, radiating down the limbs. Their gait becomes slouchy, they walk slowly and with knees flexed. They prefer to sleep on their side rather than on the back. They stand with body tilted to one side and slightly bent forward. Motions of lower back are more painful when first attempted, less painful on subsequent movements.

In those cases in which the onset is definite, the patient stands with body tilted away from side involved. Body is bent slightly forward. Where the onset is indefinite, the tilting is less marked, and the forward bending more pronounced.

The gait is slow and methodical, the step short, the knees slightly flexed. The normal curves of the spine are altered, approaching a straight line.

Bilateral sciatica is rare. Bilateral sacroiliac strain is the more common. Absence of tenderness over course of sciatic. Flexing leg with extended knee produces pain at joint. In sciatic pain is along nerve only. Flexing leg on normal side gives same findings in sacroiliac; no findings in sciatica.

All conditions enumerated under "methods of examination" are absent. Osteoarthritis. Other joints involved. Rigidity of spine seen here due to actual bony proliferation. Tilting of body very pronounced. Roentgen ray reveals lipping of all bones. Roentgen ray of sacroiliac strain reveals nothing. Lumbar spondylitis and tuberculous arthritis of sacroiliac joints. Actual diseased conditions revealed by proper examinations. Lumbar myositis (lumbago), tenderness over muscles. No deformty of body. Leg-raising test negative.

Convalescence should extend through a period of six months to one year. The deformity should yield to corrective measures and not recur after immobilization. A reënforced belt should be worn for an indefinite period. The pain should yield to the measures outlined, without the use of drugs.

Treatment is rest where feasible. Adhesive strapping. This should be the first method employed. The strapping should be carried from one trochanter to the other, upward to the crest of the ilium. Anteriorly, only to the anterior superior spines. By carrying them farther to the front, the pelvis is compressed forward and pressure is brought upon the synchondrosis. A pad should be placed over the sacrum.

This usually gives a measure of relief. It may be employed for a period of two or three weeks, with changes every four days. This is followed by a belt on the same principle or a reënforced straightback corset.

Where deformity exists it should be corrected as far as feasible and plaster of Paris applied in spica form, from the sternum to the knee on the involved side. This dressing is usually retained, with changes, for about one to three months. When symptoms have disappeared the jacket is next applied. The patient is instructed to refrain from any work or exercise requiring motions of the spine such as brought on the original strain.

THE ETIOLOGY AND TREATMENT OF ACUTE POLIOMYELITIS.

ROSENOW (*Journal-Lancet,* November, 1918) briefly puts forth the following facts which indicate that the pleomorphic streptococcus or the coccus found in such large numbers in the throat and tonsils and in smaller numbers in the nervous system have an etiologic relationship to poliomyelitis.

It is constantly present in the diseased tissues, from which it can be cultivated even many months after glycerolation. On injections of cultures into young rabbits and guinea-pigs it localizes flaccid paralysis and changes in brain and cord which resemble those in poliomyelitis in man. From the brain and cord of these animals the organism can be isolated, and the disease again produced. The organism has been rendered filtrable. By means of the same methods the identical organism has been isolated constantly from the brain and cord of monkeys paralyzed with fresh, glycerolated, and filtered virus. The serums of persons and of monkeys recovered from poliomyelitis agglutinate specifically the more sensitive strains both from human and monkey poliomyelitis. Injections of the recently isolated aerobic cultures into monkeys render them refractory to virus. The aerobic form of the organism from human and monkey poliomyelitis produces antibodies in the serum of horses, in a large amount common for both, cross-agglutinating these strains specifically in high dilution. The serum of a horse immunized with freshly isolated strains from monkeys protected monkeys relatively against intracerebral inoculation of virus, and had pronounced curative effects in the treatment of human poliomyelitis. Early intravenous injections were followed by almost immediate cessation of symptoms in a large series of cases.

The results of Flexner and Noguchi, so far as the cultivation of a small filtrable organism and its demonstration in the tissues in poliomyelitis are concerned, have been corroborated, but the results of Rosenow's experiments indicate that this is the anaerobic and, according to Amoss' results, a non-antigenic, form of the organism, which under aerobic cultivation clearly belongs to the streptococcic group of microorganisms. Both forms have been constantly demonstrated side by side in the tissues of poliomyelitis. Flaccid paralysis coming on soon after injection has been produced in monkeys with characteristic, although not typical, changes in the cord with aerobic cultures, but the classic picture as obtained with virus in this species has not been secured. It may be suggested, however, on the basis of results already obtained, that this is due to the development of antibodies, since the organism in the aerobic form has marked antigenic powers.

SEMINAL VESICULOTOMY IN THE TREATMENT OF GONORRHEAL RHEUMATISM.

DILLON (*California State Journal of Medicine,* November, 1918) gives due credit to Fuller, who in 1901 reported on the technique and the results of his operations on the seminal vesicles. Genitourinary surgeons were slow to appreciate the value of his teachings until they had learned to recognize the types of cases most suitable for seminal vesiculotomy. When, therefore, the vesicles become the foci of chronic inflammation and, because of this

faulty drainage, the products of infection are retained within them under pressure, it is easy to understand how infectious emboli and toxins may gain entrance into the circulation and give rise to disturbances in other quite remote and apparently unrelated structures. The relationship of small dental abscesses, pyorrhea, sinus suppuration, tonsillar infections, and rheumatic inflammations is now generally acknowledged, and the cause of chronic arthritis is confidently sought for in these conditions.

From the clinical standpoint the operative results of seminal vesiculotomy for gonorrheal rheumatism have been uniformly most brilliant in all reports published. Patients who have been invalids periodically and constantly for months and years, some with monarticular affections and others with multiple joint and tendon affections, have had their pains disappear permanently from the affected joints after vesiculotomy, on awakening from ether, and even large, swollen, painful joints have often become normal in appearance within twenty-four to forty-eight hours following operation. Periarticular lesions improve much more rapidly than do intra-articular lesions.

A most satisfactory clinical result can be obtained by slitting the vesicles longitudinally and gently curetting them, and draining off the pus and infection and giving the diseased tissue a chance to heal. Fuller states that seminal vesiculotomy properly performed does not produce sterility, but on the other hand has frequently resulted in virility in cases in which sterile marriage had previously existed.

After a detailed report of ten cases the author concludes as follows: Seminal vesiculotomy appears to be a justifiable and indicated procedure in cases of gonorrheal arthritis which have failed to show a reasonable improvement after the acute and subacute urethral conditions have been cleared up by the usual methods of treatment.

The first three cases and two of the later cases have reported that there was no impairment in the sexual function.

The bacteriological etiology was rather indefinite and unsatisfactory. Probably more will be accomplished in this study by using the Rosenow method in obtaining and caring for the specimens.

The clinical results of the operations were satisfactory and very much appreciated by the patients, with the exception of one case.

A NEW OPERATION FOR HALLUX VALGUS.

RUGH (*Medical Record,* Nov. 9, 1918) holds that the ideal type of operation is that which corrects the deformity, removes the exostosis from the lower end of the metatarsal, and yet preserves the normal functions of the joint with the function of weight-bearing beneath the great-toe joint. If the osseous hypertrophy is not excessive and the deviation of the great toe not over 30 degrees, exposure of the joint by a curved longitudinal incision and removal of the exostosis from the inner side of the lower end of the bone will prove all that is necessary, though care must be had to leave no sharp edges or points on the bone as these will cause trouble later through pressure of the shoe on them. No interference with the function of the joint and no loss of the weight-bearing surface underneath the metatarsal will occur here and the results are satisfactory.

If there is more than 30 degrees eversion of the great toe, or if there is marked hypertrophy of the lower end of the metatarsal, some more corrective procedure should be employed. First, the hypertrophied portion should be removed, and then one of two methods has usually been followed: A cuneiform osteotomy may be done back of the great toe joint and the toe brought over to a straight line and so held until union has become firm; or the posterior portion of the proximal phalanx of the great toe may be removed and the remainder of the toe set over to a straight line in front of the metatarsal. Both of these methods preserve joint function and the support under the metatarsal head. Radical removal of

the distal end of the metatarsal (as in the Mayo operation) brings disability in many cases and has not infrequently been followed by ankylosis.

Rugh advises the following operation: The joint is exposed by a curved, longitudinal incision and the flap (base down) is dissected free to the lower edge of the joint. A tongue-shaped flap is then made (base backward as in the Mayo operation) and should include the bursa and the internal portion of the capsular ligament back of the proximal phalanx of the great toe. This is turned backward and the lower end of the metatarsal freed of ligamentous attachments. With a sharp osteotome or chisel, sufficient of the epiphysis of the metatarsal is then removed to allow straightening of the great toe. This usually amounts to about one-fourth inch. This cut also is made slightly diagonal from within outward and from behind forward. The inner sharp and hypertrophied corner is next removed with the osteotome, and if this instrument is properly sharpened a mallet is unnecessary, as the edge can be pushed through the bone with the hand alone. The top and under parts of the epiphysis are then taken off to make a wedge-shaped end on the bone. The slant on the top can be made very much greater than underneath so as to leave as much weight-bearing surface as possible. There will also remain the supporting surfaces of the sesamoid bones on the under surface of the joint. The tongue-shaped flap is then passed across the end of the bone, covering in the wedge, and secured with sutures if necessary. Sutures are then passed from the base of the tongue-shaped flap on the inner side to the base of the proximal phalanx, sewing back and forth to hold the toe toward the inner side. The skin incision is next closed and dressings applied to hold the toe inward. The bandage should make a figure-of-eight about the toe and foot and hold the toe horizontal and slightly adducted. In some cases a splint of wood or plaster may be advisable, but this is seldom necessary. After two weeks' time the use of the foot is permitted and weight-bearing advised.

Ankylosis is practically impossible because of the hinge-joint which is secured, weight-bearing is preserved, and the deformity is removed. The operation is simple of performance, and the results in twelve cases done thus far have been excellent.

THE INGROWN TOE-NAIL AND THE COUP D'HACHE.

STEWART (*New York Medical Journal*, Nov. 16, 1918) states that operations for ingrowing toe-nail are many; yet their outcome is not all that it might be, despite the fact that the first issue may have been satisfactory to the operator. In fact it might have remained satisfactory to the patient had he not been compelled to wear shoes that never were designed to agreement with the measurements and structures of any human foot. Rather were those foot coverings made with the idea in mind that a big, strong, straight, well-arched, uncallosed, and undeformed foot was a monstrosity, once admired perhaps, though only by Greek sculptors, pagan sandal wearers, and such people, but having no tolerance among the hobblers who parade the middle aisle among the so-called lucky ones, or among the so-called unfortunates who stand behind a counter or before a piece of machinery.

The high-priced shoe pinches laterally or horizontally, though the cheap shoe bears or presses down vertically. Therefore the nail hook of the workman is fairly likely to cut almost directly downward against the solid resistance of the sole of the shoe, as that rests upon the ground and the foot is wedged forward into a narrower and a compressing space. The uncus of the man of fashion, who wears a pointed boot, is apt to cut laterally against the counter pressure of the second toe. This depends upon the bearing of the shoe, though it will often be found that a right-handed man has his right toe affected, and *vice versa*. If both toes

—of both feet—are involved, the worse is usually upon the side of the most employed hand.

Anger's and Cotting's operations have been popular. Anger's requires suturing, and Cotting's is somewhat easier to perform, while it is rather more certain of securing success. This latter operation is performed by a transfixion of flesh and nail with a sharp-pointed knife, and then, from the point of transfixion, cutting backward and forward so that a slice containing healthy and unhealthy tissues together with the hook of the nail is cut away. After granulation, cicatrization, and contraction of the open wound are complete, the flesh is drawn away from the nail and a permanent cure is obtained through the process of healing.

The method here suggested implies taking two wooden tongue depressors that should be fixed firmly with adhesive strips in such a manner that the proximal piece of plaster compresses the blood-vessels, by surrounding the proximal phalanx of the great toe, thus insuring a non-wabbling, bloodless, operative field that mitigates the dangers of cocaine absorption by furnishing a free exit through the open incision, with a blocked entry through the compression. The distal ends of the two depressors should have their binding plaster strip free of the toe—*i.e.*, beyond the outer end. If the wooden depressors are properly placed, a line drawn with a pencil, using their edges as a ruler and guide, should pass one-eighth inch to the mesial side of the hook of the offending nail. Whatever projects beyond that guiding line or protrudes between the guiding edges of the tongue depressors with which that line was made should be sawn off with a heavy razor or suitable knife, and this from a point a full quarter-inch proximal to the lunula to the distal end of the slice that is to be removed. Such a slice includes germ nest, uncus, sound and unsound tissue. Stitching is not necessary, ligation should be avoided, if possible, and the scar will not touch the sole of the shoe when walking, later. Healing is expedited by non-sticking dressings and the absence of the act of tearing off scabs, together with the employment of a properly cut shoe. The sole objection to the operation is urged upon the grounds of extreme simplicity of method.

The patient should walk well in a week, and usually has done so in less time; though seventy-two hours in bed is a great help to rapid healing.

PAINFUL FEET.

SCHAUFFLER (*Journal of the Missouri State Medical Association*, November, 1918) finds that every year he prescribes a smaller number of Whitman flatfoot supports, or other rigid devices. A comparatively small dimple behind the heads of the metatarsals, produced by felt fastened to the foot or by hard felt placed in the shoe, either nailed in place or put on the underside of an insole, is sufficient to correct many of the anterior arch troubles. The common mistakes are in making these felt pads too large, or placing them too far forward, or combining it with a longitudinal arch support which is not needed and which often makes it worse.

The choice of shoes is difficult. One group are constructed on the principle that no support should be given to the arch of the foot; that the patient should walk as nearly as possible barefooted, the shoe only furnishing protection to the foot and guiding the forefoot inward. The ground gripper belongs to this class. Another shoe is made extra rigid by the insertion of a metal shank or an arch support built into the last. The so-called anatomic shoe is an illustration of the second class. Some shoes are built merely with a low heel and very broad toes, with no special shaping. The "Educator" is an example of this group. The Munson army last is good. About 95 per cent of men can wear them if these conditions are observed, namely, careful fitting, special attention to developing and toughening the foot, a refitting after three to six months.

The great majority of boys, as they grow up, would be benefited by a shoe of the first type. Many little girls, however, who have slender feet with high arches, need to have a nicely fitted shoe which gives slight support to the arch by the shaping of the shoe on the inner side. Every proper shoe should allow plenty of room for the toes that they may not be crowded together or crowded back. Many people need to have a fairly snug fit behind the heads of the metatarsals, in order to help hold them firmly together and so prevent their being separated at times of special stress.

People consult a doctor because their feet hurt, and unless he is able to relieve the pain within a comparatively short time they will not continue his treatment. The general plan is to splint these feet as much as is necessary to relieve pain and, at least, partly correct deformity, and then gradually to withdraw the splinting, making an earnest effort to teach the foot to hold itself in the proper position by the shortening of ligaments and strengthening of muscles, combined with correct shoes, which should have the minimum of alterations or internal appliances necessary to prevent relapse.

NOTES ON THE SURGICAL TREATMENT OF EMPYEMA.

BABCOCK (*Medical Record*, Nov. 2, 1918) notes that pleural effusions so prevalent in the various army camps and cantonments during the past winter have been associated with a mortality so high as to demand special consideration. The effusions for the most part have occurred after measles and croupous pneumonia, and have given an average mortality of 31 per cent, but in some camps it has reached 65 per cent, 84 per cent, and even 100 per cent. The microörganism chiefly responsible, and giving unusual features to the epidemic, is the Streptococcus hemolyticus.

Three periods characterize the epidemic as to time and virulence:

First, the period of November, December, and January, which marked the greatest intensity of the disease. At this time a typical clinical picture is that of a patient convalescent from measles, who, after exposure, develops thoracic oppression and dyspnea. There is slight lividity, deepening into cyanosis, with evidence of a rapid outpouring of serum into one or both pleural cavities. The effused fluids teem with streptococci, and at times the microörganism may be recovered from the circulating blood. In from twenty-four to seventy-two hours the patient is dead. Should the patient survive the early stages of infection, consolidation of lung, pulmonary abscess, and purulent infection of the various serous cavities may occur.

The second period of streptococcus infection as to virulence began the latter part of February and extended into April. While serious, the epidemic had lost its intense virulence, and the patients lived long enough to develop other lesions. Usually the serous pleural effusions progressed after from several days to one or two weeks to a purulent stage. Pneumonic consolidations and pulmonary abscesses not infrequently occurred, and metastatic effusions in other large serous cavities or in the joints. The presence of streptococci in the blood, while ominous, was not always of fatal import.

In April the third stage of the epidemic was observed. While the Streptococcus hemolyticus was still the predominating organism, a pyothorax was the chief lesion, but it usually was amenable to treatment, and death was rare.

The virulence of the epidemic, therefore, bore a direct ratio to the coldness of the months, and the microörganism also apparently progressively attenuated as the epidemic advanced. Not only were the infections more severe and more fatal in the early winter months, but they were more enduring and more resistant to treatment, so that empyemas starting in the early winter not infrequently continued to drain until spring or summer, while those beginning late in the epidemic often closed first. In part this may be the result of better management, but irrespective of the treatment

it is evident that the late cases were much less virulent and much more amenable to treatment than those of the early months of the epidemic. Not only this, but patients bore the larger thoracoplastic operations or decortications much better in the spring than in the winter. Statistics on methods of treatment which do not take into consideration the rapid attenuation of bacterial virulence as the epidemic progresses have little value. To this attenuation we may largely ascribe the wide diversity of surgical opinion.

Babcock has employed the following method: For sudden effusions, with cyanosis and marked dyspnea of streptococcic origin, no treatment or simple paracentesis to relieve pressure temporarily. As showing the early virulence, of eight cases treated by aspiration or puncture drain seven died, one patient recovering after a single aspiration of a small quantity of thick pus.

For acute serous or seropurulent effusions a single thorough irrigation with Dakin's fluid, under local anesthesia by one-per-cent procaine, is used. Two rather stiff rubber tubes, size 18 to 25 F., are introduced into the cavity. A large, short trocar is employed, the tubes being carried into the cavity through the cannula. The skin is incised and the trocar introduced into the cavity at two points. The tubes are introduced separately and the cannula withdrawn, leaving the tubes in place. One tube has its outlet dependent and under fluid, the other is attached to a sterile funnel containing warm Dakin's fluid. Without permitting air to enter, the irrigation is continued with a pressure head of fluid not greater than 10 inches until the faint tint of the permanganate color of the Dakin fluid is observed at the outlet. The chest is now emptied, the tubes withdrawn, and the puncture openings dressed with gauze wet with dichloramine-T in chlorcosane. Of four cases treated by a single antiseptic irrigation, one died and two recovered without further operation.

Empyema with creamy or curdy pus is treated by introducing under local anesthesia by means of a large trocar, stiff rubber tubes, size 30 to 36 F., with a terminal and one lateral opening. The tubes are graduated with indelible ink before sterilization, so that their depth of introduction may always be evident. They are passed through the same or contiguous intercostal spaces to a depth just sufficient to place the lateral opening well within the cavity. One tube is fastened to a Dakin reservoir, the other empties under solution in a container placed under the bed. The tubes are fastened to the chest wall by adhesive plaster. The height of the surface of the Dakin should not be more than 10 inches above the chest cavity. Every two hours from 50 to 200 Cc. of the Dakin solution is permitted to enter the pleural cavity. This should not produce pain, and often will not arouse the patient if asleep. About 1/5 or 1/4 more fluid escapes than enters the chest, due to the aspirating action of the drainage. As a rule the tubes remain nearly water-tight where they pass through the chest wall.

If the treatment is painful or the drainage imperfect the tubes should be promptly readjusted, reintroduced at some new point, or discarded in favor of some other form of treatment. Excessive pressure in instillation or improperly placed tubes may cause pain, extension of the pleural inflammatory process, or leakage into the subcutaneous or muscular tissues with the possible production of an axillary or subpectoral abscess. Large tubes by pressure may also cause necrosis of adjacent ribs. To prevent leakage under the skin it is wise to make the skin incision distinctly wider than is necessary for the introduction of the tubes. The object is to sterilize the cavity, and the tube should be withdrawn as soon as clinical sterility is accomplished.

Of eleven patients treated in this manner, two died, six were healed without other forms of operation, one required secondary thoracostomy, one a costatectomy, one a pulmonary decortication. Five of the patients have returned to duty and one is healed awaiting discharge; three having had

secondary operations are now nearly healed. This mortality of 18 per cent compares well with the average mortality of 32.4 per cent obtained in treating 37 cases by various methods. The duration of the irrigation in these cases was from two days to four months. After removal of the large irrigation tubes it was found wise to insert small 4-mm. Dakin tubes in the openings and to continue Dakin irrigation for two or three days to sterilize the tube tracts. The use of dichloramine-T in these openings has not been found so valuable.

Cases with persistent cavities and poorly draining sinuses are explored either through a long intercostal incision, with spreading of the ribs, or by costatectomy or thoracoplasty. In many cases, especially in old dense-walled cavities, it is more satisfactory to resect freely the ribs overlying the sinus or cavity.

Secondary closure of large thoracic cavities left after operation for empyema has been successfully carried out by Tuffier by first sterilizing the cavity by the Carrel-Dakin method, then excising the wound margins and mobilizing the skin edges, which are united without drainage. The method converts the chest cavity into a pneumothorax, which is supposed to close spontaneously. Tuffier reports success in 16 out of 23 cases. In five of the cases one was successful, two partly successful, and two failed. In none of Babcock's cases with a large cavity was the complete closure successful. His present tendency is to unite the skin and underlying muscles, leaving an adequate drain.

In these cases the affected lung is distended during expiration, and the air leakage occurs during this time. Of great importance in the after-treatment of empyema is proper exercise. Patients should be encouraged to be out of bed as soon as possible after operation, and special exercises should early be undertaken. The use of a simple improvised spirometer and manometer is of value. The interest of the soldier is excited by the daily records made, and the figures give him an incentive to progress with the treatment. Competition and association are of great value in this work. By blowing definite quantities of water from a lower bottle to a higher one, patients may be made to do a graded amount of work daily and a progressive increase in the distending force of the exercise obtained.

CELLULOID SOLUTION FOR TRACTION.

For the past three months (*British Medical Journal,* Oct. 5, 1918) experiments have been made with a 5-per-cent solution of celluloid in acetone, which makes an excellent adhesive material; 7 or 8 per cent may be used where only small areas of skin are available.

The required amount of celluloid scrap and acetone are placed in a dry, clean, wide-mouth bottle, securely stoppered, and shaken at intervals. The solution is ready for use in forty-eight to seventy-two hours, and when properly made is an almost clear homogeneous syrupy fluid.

The skin should be absolutely dry. A layer of celluloid solution is rapidly applied by a small brush. The quantity should be sufficient to soak through the strip on which traction is to be applied, and a thin coating is applied externally to get out all the wrinkles and air bubbles. Canton flannel is the best material for strips, but a double layer of gauze or muslin that is neither too hard nor too finely woven may be used. The application of iodine, picric acid, and alcohol to areas to which any type of adhesive is to be applied should be avoided as far as possible. If there is delay in putting on the strip, the skin should be recoated, for it dries out in a thin, flexible film in a minute or two. The application of a circular gauze bandage increases the effectiveness of adhesion. The solution is combustible, and it is therefore advisable to label properly.

Twenty-five applications of this solution have been carefully observed, and it is believed that the scope of traction is increased by its use.

The conclusions founded on the cases reported in the full paper are as follows:

Six per cent celluloid in acetone makes an excellent adhesive material.

Its rapid volatilizing quality permits of immediate traction.

THE BACTERIAL FLORA OF WAR WOUNDS: INFLUENCE OF TREATMENT.

GOADBY (*British Medical Journal*, May 25, 1918), in a report to the Medical Research Committee, thus concludes his study:

In summarizing his observations on wounds in home hospitals from 1915 to the present time it appears—

That the mass infection has diminished progressively, but that the persistence of anaerobic bacteria has not undergone similar qualitative reduction.

That by the use of the two antiseptics of which statistics have been available (bipp and hypochlorite) no great diminution in anaerobic flora has been effected.

That latent infection as opposed to persistent infection is of great importance in "subsequent operations," and that latent infection is determined by the treatment of the case in the first week of the injury, possibly in the first three days.

That in latent infection organisms are found in close proximity to healthy tissue and therefore in a region likely to become the site of an incision in a subsequent operation.

That bone fragments split off at the original injury invariably become sequestra, probably due to the proteolytic action of the bacteria rather than to destruction of blood supply.

That of the various methods which have so far been made use of in the immediate treatment of wounds, immediate excision of the lacerated tissues is apparently the only one that has produced a marked diminution in the anaerobic flora of the wounds.

Many wounds have been examined belonging to this class; they are frequently wounds involving bone, often with very slight bone involvement and no fracture. Histological and bacteriological examinations give the same findings, whilst the penetration of the bacteria into the bone extends a considerable distance either side of the original lesion. These wounds break down again after trivial injury or overexercise. A histological examination of tissue excised near such wounds shows the infection mainly at the junction of the normal and fibrous tissue. The outcome of bacteriological observations on a large series of wounds of latent infection, together with histological examination of excised tissue, points to the physiological action of anaerobic bacteria rather than to general toxemia as the underlying cause of the persistent infection. The most persistent organism is the B. sporogenes, which is in itself of low pathogenic power. It can, however, survive for a long time in culture tubes, when associated with streptococci or organisms of the coli group, and undergoes cyclic development, spores forming and germinating slowly but persistently, with the result that the material becomes ultimately entirely digested. In cases heavily infected with the B. sporogenes persistent local edema has been observed. Histologically, minute general thrombosis of vessels in the immediate vicinity of the wound is common; the thrombus may even spread up through the smaller vessels and project into the larger. Histological examinations of these cases show that the "splash" effect produced in the soft tissues by the velocity of the projectile extends over a considerable distance, that numerous radiating cracks in the tissue occur which become the seat of hemorrhage. The blood-clot formed contracts, associated with the discharge of serum from the wound, coincidentally the bacteria make their way into the cracks, doubtless by capillarity, and subsequently become shut off from the main wound cavity by fibrous tissue and remain latent. There is some indication that this fact has an important bearing on the practical question of the movement of wounded men. It certainly has a very practical bearing on the deep infection of the wounds.

REVIEWS.

A Text-book on Chemistry, Inorganic and Organic. For Students of Medicine, Pharmacy, Dentistry, and Biology. By R. A. Witthaus, A.M., M.D. Seventh Edition, revised by R. J. E. Scott, M.A., M.D. William Wood & Co., New York, 1919. Price $4.00.

Since the first edition of this book appeared, and particularly since the death of its distinguished author, many changes have occurred in the medical curriculum, and not the least of these pertain to the subject of chemistry. While it is true that inorganic chemistry and the principles of organic chemistry are, in general, presumed to have been mastered in premedical schools, nevertheless it is essential that the medical student shall keep his mind freshly imbued with what he has already learned during his medical course.

For the reasons given above many of the sections on Physics have been omitted. The part dealing with physiological chemistry have been left out because the subject is of such importance and of such dimensions that the reviser believes that it can best be taken from many of the excellent text-books upon this special subject now on the market. New material has been added wherever it seemed desirable.

The book has for a long time been popular in medical schools and doubtless will continue to be.

A Text-book of Physiology. By William H. Howell, Ph.D., M.D., Sc.D., LL.D. Seventh edition, thoroughly revised. W. B. Saunders Company, Philadelphia, 1918. Price $5.00.

Dr. Howell is certainly one of the most distinguished physiologists that America has produced, if he is not *facile princeps*. Not only is he known because of this excellent book, which for many years has been a standard, but also for the very valuable contributions which he has made to the department of medicine in which he has become celebrated. The work has not only gone through six editions so far, but has been reprinted a number of times, and doubtless many hundred medical men now practicing medicine are familiar with it. Dr. Howell is so actively engaged in not only the teaching of physiology but in physiological investigations that he is thoroughly familiar with the best work which is being done along these lines and the literature of the subject in general, and this new edition may be considered as the best and last word that we have at hand in regard to this important subject.

The Principles and Practice of Obstetrics. By Joseph B. DeLee, A.M., M.D. Third Edition, Thoroughly Revised. W. B. Saunders Company, Philadelphia, 1918. Price $8.50.

If the first edition of Dr. DeLee's book on Obstetrics deserved the name of being a massive volume, the present one emphasizes this point still further, there being no less than 1089 pages, including the index. These pages too are larger than the page of the average text-book. In addition there are no less than 949 illustrations, of which 187 are in colors, but it is only fair to state that, unlike many books containing colored plates, it may be said that they are all well executed and good. The book is essentially that of one who has practiced obstetrics actively and taught it to large numbers of students. Bearing as it does the strong imprint of the writer, it at times comes in conflict with the opinions of other men occupying equivalent positions elsewhere. We are glad to see that he is not an upholder of the so-called "twilight sleep," asserting that it requires a higher degree of obstetric skill than the ordinary practitioner has acquired, and that he is convinced that its general employment after its recent rebirth will result in a repetition of the fetal and maternal mortalities and morbidities of twelve years ago. This was his statement in earlier editions. He now points out that it has lost its vogue in Germany, and although he himself occasionally gives a dose of scopolamine and morphine in the first stage if it is prolonged, nevertheless he considers that the method has been weighed in the balance and found wanting.

It should be recalled that this volume is

one of the most exhaustive published upon this subject and that many of its chapters have fairly large biographies attached. It is also to be remembered that the book contains not only descriptions and illustrations of ordinary obstetric proceedings, but in addition those showing obstetric operations and operations designed to produce repair of lacerated or diseased genital organs.

THE MEDICAL CLINICS OF NORTH AMERICA, September, 1918. Volume II, No. 2. W. B. Saunders Co., Philadelphia, 1918. Price $10.

This issue of the Medical Clinics of North America is known as the United States Army issue because all the contributors to it are officers in the Medical Corps. They come from all the large centers of medical education, and their articles deal with all the themes which come to medical men in camp life.

The volume opens with an article upon Clinical Research in the United States Army Base Hospitals by former Surgeon-General Gorgas. There are interesting contributions upon Pneumococcus and Streptococcus Pneumonias; upon Cardiovascular Diseases and upon Acute Infections of the Thorax. There is also one upon Drug Addiction and another upon the Clinical Significance of Cardiac Murmurs. The last is one on The Prevention of Communicable Respiratory Diseases. Many of these articles are quite brief, which is essential in view of the large number of army contributors to this volume, which contains nearly 650 pages.

A TEXT-BOOK OF GENERAL BACTERIOLOGY. By Edwin O. Jordan, Ph.D. Sixth edition, thoroughly revised. W. B. Saunders Company, Philadelphia, 1918. Price $3.75.

The main difference between this and the preceding editions is that in the present one the chapter upon the pneumococcus has been entirely rewritten and that on the meningococcus extensively revised. Several new sections have been added, including brief summaries of our present knowledge of infectious jaundice, rat-bite fever, and trench fever. A number of minor changes and corrections have also been made throughout the text. The book is a series of lectures given to students in the University of Chicago, and the author believes that the subject is one which should find a place in every general scientific course even if the student is not striving for the degree of Doctor of Medicine. Apparatus is freely illustrated, and pictures showing the appearance of bacteria of various kinds are freely scattered through its pages. The book also includes a consideration of epidemiology, and contains a plate of the city of Hamburg in connection with its celebrated cholera epidemic.

NEOPLASTIC DISEASES. A Text-book on Tumors by James Ewing, A.M., M.D., Sc.D. W. B. Saunders Company, Philadelphia, 1919. Price $10.

This very large volume of a little over 1000 pages, containing 479 illustrations, has been prepared by the Professor of Pathology at Cornell University Medical College, New York City. Dr. Ewing is already well known for his contributions to pathological literature and for his excellent book upon Diseases of the Blood. He tells us that his object in the present volume is to present within reasonable space and in accessible form the main features of the origin, structure, and natural history of tumors. He points out that until recently the general impression was that tumors fell into a limited number of grand classes in which the forms occurring in the several organs are so nearly related as to be almost identical, which of course is not the case. The time has come when the general practicing physician and surgeon must recognize the different etiological factors which result in the inception of tumors as well as look into the more striking clinical features which are often highly characteristic of certain growths. The author states that he has paid due respect to all the standard authorities at the time that he has also been drawing upon his own large experience.

Manifestly from the size and price of this volume it is one which is more suited for the library of the professional pathologist and the active practitioner of medicine and surgery than it is to the needs of the undergraduate student of medicine, who

does not need interesting theoretical discussions, but short, positive statements which he can utilize in remembering important facts during his student days. When he gets a broader view of medicine as a whole it will be well for him in the period of rest which usually ensues between his time as a student and as a busy practitioner to make a careful study of this volume, which will, if thoroughly studied, render him for the rest of his life a much more competent physician and surgeon.

AN INTRODUCTION TO NEUROLOGY. By C. Judson Herrick, Ph.D. W. B. Saunders Company, Philadelphia, 1918. Second edition, illustrated. Price $2.00.

This apparently is an interesting illustration of the fact that a man who is a doctor of philosophy and not of medicine has written a book upon a medical theme. It is not a large volume, containing less than 400 pages and 140 illustrations, and, as will be seen by this description of its size, does not attempt to be exhaustive. The author is Professor of Neurology at the University of Chicago, but as he dates the preface to the second edition at the Army Medical Museum in Washington we presume that he has been in the war service during the last few months.

The book does not strike us as one that will help the general practitioner because it does not deal with the symptomatology of disease, but rather with the anatomy and physiological functions of the nervous system as they are at present understood. To those who wish to refresh their minds and learn new facts concerning modern views the book can be commended. To those who wish a volume on the diagnosis and treatment of nervous diseases the text is not suitable.

PATHOLOGICAL TECHNIQUE. By F. B. Mallory and J. B. Wright. Seventh edition, revised and enlarged. W. B. Saunders Company, Philadelphia, 1918. Price $3.75.

Mallory and Wright on Pathological Technique has become a standard book in medical literature. It is now twenty-two years since the first edition appeared. The present edition has been revised and enlarged and contains 181 illustrations. The book has been popular from the beginning because it represented the experience of men who are actively engaged day after day and year after year in the practice of pathological technique and who are thoroughly familiar with all the methods which are employed, and are, therefore, competent to suggest the best methods for those who are not such adepts as themselves. It covers about 550 pages, and is such a book as is needed by the young pathologist who is entering upon his hospital duties and by the student who is endeavoring to become skilful in this line of work.

A MANUAL OF DISEASES OF THE NOSE, THROAT AND EAR. By E. B. Gleason, M.D. W. B. Saunders Company, Philadelphia, 1918. Fourth edition, thoroughly revised. Price $3.00.

This book, which appeared first in 1907, and which has been reprinted and revised a number of times, has reached its fourth edition within seven years. It is well illustrated and contains descriptions of the instruments and apparatus which the specialist along these lines commonly employs. It is not an exhaustive treatise like that of Ballenger, but a work of moderate size, which probably accounts for the popularity with which it has been received. At the close of the volume there are a number of prescriptions designed to place in the hands of the practitioner those mixtures or single drugs which seem to give the best results in diseases of the ear, nose, and throat.

A MANUAL OF GYNECOLOGY. By John Cooke Hirst. W. B. Saunders Company, Philadelphia, 1918. Price $2.50.

This is a small handbook on gynecology which does not attempt to quote current literature and is essentially a working manual which will prove of great use to the student and general practitioner rather than to the professional gynecologist. It not only tells him what to do, but by giving direct and definite advice enables him to determine what the general practitioner should not do. It is clearly written, well balanced, and deserves to be popular, for it is direct and to the point.

Surgical Treatment. By James Peter Warbasse, M.D. In Three Large Octavo Volumes, and Separate Desk Index Volume. Volume II. Illustrated. W. B. Saunders Company, Philadelphia and London, 1918. Per Set, Cloth, $30.

The second volume of Warbasse's comprehensive treatise on Surgical Treatment covers as subtitles Treatment of Injuries and Diseases of the Head; The Spine; The Neck; The Thorax; The Breast; and The Abdomen. It is cheering to note an absence of that enthusiasm for lumbar puncture in all cases of head injury which seems to be the modern and, it is to be hoped, the passing fashion. Decompression the author regards as an operation which has proved of much value. For spontaneous cerebral apoplexy the author states that the surgeon may expose the brain and relieve the pressure by draining the clot focus. The various head operations are described both with brevity and clarity gratifying to the surgeon. The subject-matter under the head of The Eye includes much that should be known by every surgeon and concerning which he is entirely ignorant. Although it is helpful, there seems to be no mention of treatment of wounds of the cornea by transplantation of the conjunctival flap. The nose is considered from the general rather than the special standpoint. The same may be said of the larynx and trachea. Lane's operation for cleft palate is well described and pictured. The brief section devoted to the spine would seem adequate to one doing general work. In the neck, as could be expected, goitre is considered at some length. The empyema question receives due consideration. Suture of wound of the heart is graphically portrayed.

There is also a picture of Meyer's differential pressure cabinet, and one of a special table for operations on the thorax in which the patient is held almost vertically, but tilted to one side, leaving the other side of the chest freely exposed. An excellent description with illustrations of the breast operations. The section headed The Abdomen is prefaced by a discussion of general principles characterized by sound sense and anatomical knowledge. The transverse incision is pictured and its advantages pointed out. There is an excellent summary of drainage. Thereafter the abdominal diseases are taken up in some detail. In this section of the work the illustrations are particularly commendable, and to it more attention is given than to any other. The pancreas and spleen receive brief mention.

A sound book covering in a brief space a very wide ground and affording a ready reference and a rapid review for those who wish to keep abreast with the progress of surgery.

CORRESPONDENCE.

PITUITRIN IN THE TREATMENT OF INFLUENZA.

To the Editors of the Therapeutic Gazette.

Sirs: During our epidemic of influenza I had three cases, one with relapse, which seemed hopeless unless something more was done, the large area of pulmonary râles and tubular breathing indicating a serious condition. Pituitary extract, by its action upon the cardiovascular system, seemed the only remedy likely to be beneficial, though I had not known of it being used in these cases.

Two of the patients had been sick a week, one only a day or two. One patient received three injections, twelve hours apart, of 1 Cc. pituitary extract; the other two patients, one-half Cc. The great improvement following these injections, noticeable even after the first, seemed due to the pituitary extract; but reason told me "the appearance of one robin did not make it spring." Snce then I have read that Renon and Delille found that pituitary extract favorably influenced the course of influenza, rapid recovery resulting in patients as old as sixty-three and eighty years. These results were confirmed by Azam in influenza. Sajous says the pituitary extract is useful in infectious disorders.

A. Radcliffe.

Waukegan, Ill.